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Editor's Notes & Ethics Statement

The International Conference on Biomedical & Health Informatics (BHI'19) and the Body Sensor Networks Conference (BSN'19) of the IEEE Engineering in Medicine and Biology Society hosted an electronic paper submission process for the conference. It was the responsibility of the submitting Author to ensure the document was viewable and without errors that would prevent the Conference from including the paper in the Digital Proceedings or Website. In the event a paper was submitted that could not be viewed or printed properly, the Conference elected to only publish the abstract of the paper in the Proceedings. All conference papers were peer-reviewed by experts chosen by the BHI/BSN Conference Editorial Board for all contributed and Special Session papers.

The EMBS AdCom approved the following Code of Ethics to provide a guideline of ethical consideration for all members and to establish its support for ethical conduct in research.

Patients and Human Subjects
1. Respect human dignity and privacy of patients and human subjects.

Information
2. Ensure proper safeguarding of all confidential information, including information pertinent to patients, subjects, commercial entities, and trade secrets.

Environment
3. Promote a culture of cost-effectiveness.
4. Support the preservation of a healthy environment.

Research
5. Engage in research aimed at advancing the contribution of science and technology to improving healthcare provision.
6. Report research results with scientific integrity and proper due credit.
7. Observe the rights of human research subjects and strive for a balance between benefits and potential harm.
8. Ensure a responsible and humane use of animals in research.
9. Conduct clinical research studies in accordance with Good Laboratory Practices (GLP) and Good Clinical Practices (GCP).

Profession
10. Hold in high regard the inter-disciplinary nature of healthcare delivery and research. Foster collegial inter-disciplinary relationships. Respect, value, and acknowledge the contribution of others.
11. Encourage a culture of knowledge exchange and mentorship.
12. Avoid or properly disclose conflicts of interest.

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Welcome Letter

Dear Colleagues:

On behalf of the Organizing Committee, we are honored and delighted to welcome you to two flagship conferences of the IEEE Engineering in Medicine and Biology Society (EMBS), the **International Conference of Biomedical and Health Informatics** and the **International Conference on Wearable and Implantable Body Sensor Networks** (**BHI-BSN 2019**). This is the 2nd time that these two conferences are co-located with a grand vision that jointly, they provide a better forum for exchanging exciting ideas and advances. These conferences will be held at Dorin Forum, University of Illinois at Chicago, in Chicago, IL, USA during May 19-22, 2019 (https://www.bhi-bsn-2019.org/).

Biomedical and Health Informatics (**BHI)** encompasses methods and systems that communicate and process data to extract information and knowledge for health, healthcare, life sciences and biomedicine. After a series of successful meetings in Hong Kong in Asia, Valencia in Spain, Las Vegas, and Orlando, BHI comes to Chicago USA in 2019.

The central theme of **BHI2019** is: "*Integrative Informatics and Modeling for Precision and Preventive Medicine*". **BHI2019** has **nine oral sessions** covering advances of AI and computation modeling in Biomedicine, Health and Life Sciences, including Bioinformatics; Biomedical Signal Processing Informatics; Clinical and Public Health Informatics; Imaging Informatics; Sensor Informatics; Behavior Informatics; Rehabilitation Informatics; and Big Data Analytics and Machine Learning. It also has **seven special sessions** covering topics from genome security to wearable sensor informatics, **four workshops** and **two tutorials** on timely topics such as brain network analysis and deep learning for drug response. The "Women in Biomedical Engineering" workshop addresses the important task of inspiring women as new leaders in our profession.

This year, **BHI** set multiple records in comparison to all previous years. It has **394 regular 4-page IEEE conference paper**, **34% increase** over BHI2018 (294 papers). After rigorous peer-review conducted by the **BHI2019** technical program committee, **123** 4-page papers were accepted into the IEEE Conference Proceedings (**31% acceptance rate)**, with only **11%** selected as **43** oral presentations in nine oral sessions. **BHI2019** has **128 1-page abstracts** submitted for poster presentations, a **32 % increase** over BHI2018. In addition, **28 1-page special session abstracts** are included in the final program.

Body Sensor Networks (**BSN)** provides innovative ways to connect wearable, ingestible, and implantable devices for improving patients' comfort and treatment outcomes. They offer novel ways to measure physiology and behavior from users and turn them into actionable information to form closed-loop therapeutic systems. After a successful series of meetings held in Imperial College London, MIT Media Lab, RWTH Aachen, CU Hong Kong, UC Berkeley, Singapore NUS, UT Dallas, ICL London, MIT Lincoln Lab, ETH Zurich, MIT, UC San Francisco, Philips Eindhoven, Las Vegas, **BSN** is being held for the first time in Chicago this year.

BSN2019 features three Pre-Conference Workshops, two Special Sessions and a Student Colloquium. In addition, a total of **42** 4-page regular IEEE conference papers, and **24** 1-page abstracts/live demos were accepted for presentation. The presentations were organized into a single track of five oral sessions and two poster sessions. All submissions were rigorously reviewed by the **BSN2019** technical program committee. The acceptance rate of the IEEE 4-page papers is **41%** and **24%** of the submitted papers were selected for oral presentations.

The **BHI2019** and **BSN2019** organizing committees (OCs) greatly appreciate multiple sponsors from US National Science Foundation (**NSF**), academic institutions, industry, and society to jointly support BHI and BSN as the fast growing discipline, to provide education opportunities to young professionals and future leaders, to grow our community, and to make great societal impact on biomedicine and health. We organized multiple exciting joint events for our participants:

(1) Nine (9) distinguished plenary keynote speakers from academic institutions, the high tech industry, health care industry, medical society, and government agency to share their insights and accomplishments in research innovation, commercial development, and their vision in future directions in healthcare.

(2) Eight (8) featured sessions and activities are organized to assist participants to excel and grow:
- "Clinical and Translational Panel"
- "Meeting with Funding Agencies"
- "Meeting with the Editors-in-Chief"
- "Student Meeting with BHI-BSN Leaders"
- "Women in BHI and BSN"
- "Industry Showcase"

- "Student Colloquium" for students receiving NSF support
- "BHI and BSN Technical Committee Meetings"

In addition, we have organized the following to further promote knowledge sharing, innovation, and networking among conference attendees:
(3) All accepted 4-page poster papers will be given an opportunity to speak in the Plenary Rapid Fire session on Monday, in addition to poster presentations.
(4) All accepted 1-page papers will have an opportunity to speak in the Rapid Fire session on Tuesday.
(5) All posters will be displayed for one full day.
(6) All papers and posters complying with the conference guideline are eligible for awards selection.
(7) All selected papers of the two conferences will also be invited to submit as a full paper to two flagship journals in the fields: *IEEE Journal of Biomedical and Health Informatics* and *IEEE Transactions on Biomedical Circuits and Systems*.
(8) Lunches, coffee, and welcome reception are provided for participants to promote fruitful scientific networking in an informal and relax context.

We want to express our deepest appreciation to the members of the **BHI-BSN** steering committee, **BHI2019** and **BSN2019** organizing committees and technical program committees, the associate editors, as well as all the reviewers for their dedication and hard work in creating an excellent scientific program. We want to thank all authors who submitted papers, and all of you for being here to take part in BHI-BSN2019 to share your work.

We look forward to meeting you all for this exciting and memorable event!

Jie Liang University of Illinois at Chicago BHI 2019 Co-Chair	**Dimitrios I. Fotiadis** University of Ioannina BHI 2019 Co-Chair	**Carmen Poon** The Chinese University of Hong Kong BSN 2019 Co-Chair	**John Rogers** Northwestern University BSN 2019 Co-Chair

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General Information

Location for Workshops – Sunday, May 19th
University of Illinois at Chicago Student Center East
750 S Halsted
Chicago, IL 60607

*All meeting rooms and functions are located on the 3rd Floor

Location for Main Conference – Monday, May20th – Wednesday, May 22nd
Dorin Forum
University of Illinois at Chicago
725 W Roosevelt Rd,
Chicago, IL 60608, USA

Registration (Sunday)
Registration on Sunday is for Workshop participants only. Registration is located in the Foyer of the UIC Student Center East.

Registration (Monday-Wednesday)
Registration is located in the Foyer of the UIC Dorin Forum and will be open from Monday, May 20th through Wednesday, May 22nd. Staff will be able to assist you during the following times.

Sunday, May 19   07:00 – 18:00
Monday, May 20   07:00 – 18:00
Tuesday, May 21   07:00 – 18:00
Wednesday, May 22   07:00 – 16:00

Badges
Attendees must wear their badges at all times to gain access to the conference. Badges validate your registration and may be utilized to validate admission to sessions, tutorials, welcome reception, etc. Badges can be obtained at any registration area during the hours above. The name you provided for registration will be the name that appears on your badge.

Social Functions
Lunch and coffee breaks are provided each day of the conference for conference attendees. The Monday welcome reception and poster session receptions are included in the registration fee.

Poster Sessions
All Posters will be on display either in Session #1 on Monday or Session #2 on Tuesday during the conference. Please hang your poster up by 1:00 PM the day of your session. Authors are required to be presenting their posters based on the timing below. Rapid Fire Sessions will take place just prior to the poster sessions on both days.

Poster numbers are indicated in the program according to the conference, day, and number. These identifiers precede the paper title in the Technical Program listing.

Ex. BHI-M-1 corresponds to Poster Board #1 where you will find the BHI paper in the Monday Poster Session.

Poster Session #1: Monday May 20   19:15 – 20:15
Poster Session #2: Tuesday, May 21   18:10 – 19:10

Parking
Ample parking is located two blocks west of the UIC Forum at 1135 S. Morgan St. Lot 5.

Wireless Access
Complimentary Wi-Fi will be available in the Meeting Space.

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J-BHI Special Issue

IEEE JOURNAL OF

BIOMEDICAL AND HEALTH INFORMATICS

J-BHI Special Issue on "Integrative Sensor Networks, Informatics and Modeling for Precision and Preventative Medicine"

The topics of integrative sensor networks, informatics and modeling bring together the tightly coupled and rapidly developing fields of biomedical and health informatics and body sensor networks. Biomedical and health informatics encompasses methods to extract and communicate information from data in order to impact health, healthcare, life sciences and biomedicine. Body sensor networks provide one means to measure the needed data, through continuous monitoring in both clinical and free-living environments. Recent developments in these areas will be highlighted at two co-located conferences: the 2019 IEEE-EMBS International Conferences on Biomedical and Health Informatics (BHI'19) and Wearable and Implantable Body Sensor Networks (BSN'19) (https://www.bhi-bsn-2019.org).

Biomedical and health informatics topics include: predictive models, databases, and big data analytics that optimize the acquisition, transmission, processing, monitoring, storage, retrieval, analysis, visualization and interpretation of vast volumes of multi-modal biomedical data, as well as related social, behavior, environmental, and geographical data. These technologies are being deployed in solutions that integrate key technologies including machine learning, artificial intelligence, Internet of Things, mHealth, e-Health, human computer interface, telemedicine, bioinformatics, sensors, imaging, and public health monitoring, to achieve patient-centric and outcome-driven effective health care.

Body sensor networks provide innovative ways to improve treatment outcome and patients' comfort. They offer novel ways to measure physiology, behavior observations from users. Leveraging innovative systems, communication modules, on-chip and off-line data processing and modeling, these measurements are turned into actionable information. Formation of closed-loop body sensor networks with therapeutic and interventional functions is becoming a reality.

Only original research contributions will be considered. Topics of interest include, but are not limited to, the following:
- Bioinformatics (including biomedical sensor, signal and image processing)
- Behavioral Informatics
- Big data analytics and machine learning
- Clinical and public health informatics
- Precision medicine and disease-oriented informatics
- Prototyping of body-worn, ingestible and implantable sensor networks
- Novel chemical, biological and textile body sensors
- Flexible, stretchable, ultralow power or battery-less electronic sensors and systems
- Body area communication protocols, models and theories;
- Security, privacy and trust in body sensor networks

Guest Editors
Wei Chen – Fudan University, China
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David Clifton – University of Oxford, UK
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Key Dates
Deadline for Submission: 1 Oct 2019
First Reviews Due: 1 Jan 2020 Revised Manuscript
Due: 1 Mar 2020
Final Decision: 1 Apr 2020

Program at a Glance – Sunday, May 19th

	Room: Dearborn A	Room: Dearborn B	Room: Illinois A	Room: Illinois B	Room: Cardinal
	Sunday, May 19, 2019 - Workshops				
7:00 - 18:00	**Registration** Location: Illinois Foyer, UIC Campus Center East				
9:00-10:30	WS 1.1: Workshop on Brain Network Analysis **Moderator:** Maggie Cheng (Illinois Institute of Technology)	WS 2.1a: Deep Learning for Computational Genomics and Drug Response Prediction **Moderators:** Yufei Huang (University of Texas at San Antonio); Yidong Chen (University of Texas Health Science Center at San Antonio)	WS 3.1a: Bio-Integrated Flexible and Stretchable Electronics for Skin Sensor Networks **Moderators:** Gaetano Marrocco and Sara Amendola (University of Rome Tor Vergata); John A. Rogers (Northwestern University)	WS 4.1a: Using mHealth Technology to Enable the Clinical Trial of the Future **Moderators:** Paolo Bonato and Federico Parisi (Harvard Medical School); Bjoern Eskofier (Friedrich-Alexander University Erlangen-Nuernberg)	
10:30-11:00	**Coffee Break** Location: Illinois Foyer				
11:00-12:30	WS 1.2: Women in the Biomedical Engineering Workforce: Inspiring new leaders and professional development. **Moderators:** Maria Fernanda Cabrera-Umpierrez and Maria Teresa Arredondo (Life Supporting Technologies; Tech University of Madrid); Holly Jimison (Northeastern University)	WS 2.1b: Deep Learning for Computational Genomics and Drug Response Prediction **Moderators:** Yufei Huang (University of Texas at San Antonio); Yidong Chen (University of Texas Health Science Center at San Antonio)	WS 3.1b: Bio-Integrated Flexible and Stretchable Electronics for Skin Sensor Networks **Moderators:** Gaetano Marrocco and Sara Amendola (University of Rome Tor Vergata); John A. Rogers (Northwestern University)	WS 4.1b: Using mHealth Technology to Enable the Clinical Trial of the Future **Moderators:** Paolo Bonato and Federico Parisi (Harvard Medical School); Bjoern Eskofier (Friedrich-Alexander University Erlangen-Nuernberg)	
12:30-13:30	**Lunch** Location: Illinois Foyer				
13:30-15:00	WS 1.3a: Modelling in Bioengineering and Bioinformatics **Moderator:** Nenad Filipovic (University of Kragujevac)	TT 2.1: Integrating and Modelling Multi-Faceted Daily and Night Sleep Data for Precision Sleep Medicine and Prevention of Sleep Disorders **Moderators:** Panagiotis Bamidis and Christos Frantzidis (Aristotle University of Thessaloniki)	WS 3.1c: Bio- Integrated Flexible and Stretchable Electronics for Skin Sensor Networks **Moderators:** Gaetano Marrocco and Sara Amendola (University of Rome Tor Vergata); John A. Rogers (Northwestern University)	WS 4.1c: Using mHealth Technology to Enable the Clinical Trial of the Future **Moderators:** Paolo Bonato and Federico Parisi (Harvard Medical School); Bjoern Eskofier (Friedrich-Alexander University Erlangen-Nuernberg)	WS 5.1a: Automated Dietary Monitoring 2019 **Moderators:** Oliver Amft (Friedrich-Alexander University Erlangen-Nuernberg); Samantha Kleinberg (Stevens Institute of Technology); Benny Lo (Imperial College London); Edison Thomaz (University of Texas at Austin)
15:00-15:30	**Coffee Break** Location: Illinois Foyer				
15:30-17:00	WS 1.3b: Modelling in bioengineering and bioinformatics **Moderator:** Nenad Filipovic (University of Kragujevac)	TT 2.2: Data Analytics in HealthCare **Moderators:** Themis Exarchos (Ionian University); Vasileios Pezoulas (University of Ioannina)	WS 3.1d: Bio-Integrated Flexible and Stretchable Electronics for Skin Sensor Networks **Moderators:** Gaetano Marrocco and Sara Amendola (University of Rome Tor Vergata); John A. Rogers (Northwestern University)	WS 4.1d: Using mHealth Technology to Enable the Clinical Trial of the Future **Moderators:** Paolo Bonato and Federico Parisi (Harvard Medical School); Bjoern Eskofier (Friedrich-Alexander University Erlangen-Nuernberg)	WS 5.1b: Automated Dietary Monitoring 2019 **Moderators:** Oliver Amft (Friedrich-Alexander University Erlangen-Nuernberg); Samantha Kleinberg (Stevens Institute of Technology); Benny Lo (Imperial College London); Edison Thomaz (University of Texas at Austin)

Program at a Glance – Monday, May 20th

Monday, May 20, 2019 - Schedule		
MEETING ROOM DE	**MEETING ROOM GH**	**MEETING ROOM F**
7:00-18:00 — **Registration** / **Location: Foyer**		
8:00-8:15 — **Opening Welcome** / Jie Liang - BHI OC Chair, University of Illinois at Chicago / Carmen Poon - BSN OC Chair, The Chinese University of Hong Kong / **Location: Main Hall AB**		
8:15-8:30 — *AM Opening Remarks* / *Chancellor Michael D. Amiridis, University of Illinois at Chicago* / **Location: Main Hall AB**		
8:30-10:00 — *Keynote Speakers:* / *Shankar Subramaniam (President of EMBS):* / *"Neurons in Pathology through the Lens of Multi-omics and Data Analytics"* / *Elazer R. Edelman (Massachusetts Institute of Technology):* / *"How Computational Modeling Drove Revolution in Cardiovascular Medicine"* / **Location: Main Hall AB**		
10:05-11:35 **BHI Session # 1:** Biomedical Signal Processing Informatics I **Chairs:** Kai Keng Ang (Institute for Infocomm Research, A*STAR); Taufiq Hasan (Bangladesh University of Engineering and Technology)	**BHI Special Session # 1:** Nonparametric Statistics in Omics Applications **Chairs:** Ahmed A. Metwally (Stanford University); Alan Perez-Rathke (University of Illinois at Chicago)	**BSN Session # 1:** Machine Learning, Deep Learning and Decision Support Algorithms **Chairs:** Roozbeh Jafari (Texas A&M University); Karl Friedl (University of California, San Francisco)
11:35-11:55 — **Coffee Break** / **Location: Main Hall AB**		
11:55-13:25 **BHI Session # 2:** Biomedical Signal Processing Informatics II **Chairs:** RamasubbaReddy Machireddy (Indian Institute of Technology Madras); Gert Mertes (University of Oxford & KU Leuven, Belgium)	**BHI Special Session # 2:** AI Techniques for Multi-Modality Medical Big Data **Chairs:** Ye Li (Shenzhen Insititutes of Advanced Technology); Raffaele Gravina (University of Calabria)	**BSN Session # 2:** Biodegradable and Flexible Electronic Sensing **Chairs:** Canan Dagdeviren (Massachusetts Institute of Technology); Gaetano Marrocoo, (University of Rome Tor Vergata)
13:25-14:40 — **Lunch** / **Meeting with Funding Agencies** / Wendy Nilson (NSF); Suzana Petanceska (NIH NIA); Jean Yuan (NIH CSR); Elebeoba May (NSF MCB) / **Moderator:** Stephen Wong (Houston Methodist) / **Location: Main Hall AB**		
14:45-15:30 — *Keynote Speaker:* / *Ketan Paranjape (Roche Diagnostics Corporation):* / *"Integrating and Presenting Patient Data for Personalized Cancer Healthcare"* / **Location: Main Hall AB**		
15:35-17:05 **BHI Session # 3:** Big Data Analytics and Machine Learning I **Chairs:** Edward Delp (Purdue University); Zhiguo Zhou (University of Texas Southwestern Medical Center)	**BHI Session # 4:** Bioinformatics **Chairs:** Kamal Taha (Khalifa University of Science, Technology and Research); Ramana Davuluri (Northwestern University)	**BSN Session # 3:** RF, Wireless Communication, Security and Privacy **Chairs:** Brian Telfer (Massachusetts Institute of Technology); Edward Sazonov (University of Alabama)
17:05-17:40 — **Coffee Break** / **Location: Main Hall AB** / **Networking with Leaders** / **Moderator:** Ahmed Metwally (Stanford University) / **Location: Main Hall C**		
17:40-19:15 — **Rapid Fire Session # 1** / **Chairs (BHI):** David Clifton, (University of Oxford); Georgia Tourassi (Oak Ridge National Laboratory) / **Chairs (BSN):** Shanshan Chen (Virginia Commonwealth University); Kunal Mankodiya (University of Rhode Island) / **Location: Main Hall AB**		
19:15-20:15 — **Poster Session # 1** / **Location: Main Hall C**		
20:15-21:45 — **Welcome Reception** / **Location: Main Hall AB**		

Program at a Glance – Tuesday, May 21st

	MEETING ROOM DE	MEETING ROOM GH	MEETING ROOM F
	Tuesday, May 21, 2019 - Schedule		
7:00- 18:00	**Registration** **Location: Foyer**		
8:00-8:45	**_Keynote Speaker:_** _Arun Jayaraman (Northwestern University):_ _"Wearable Sensors, Smart Phones, and Machine Learning: Impact on Clinical Care and Clinical Trials"_ **Location: Main Hall AB**		
8:50-10:20	**BHI Session # 5:** Big Data Analytics and Machine Learning II **Chairs:** Chien-Liang Liu (National Chiao Tung University); Ertan Balaban (The University of Manchester)	**BHI Special Session # 3:** Genome Security and Privacy **Chairs:** Gamze Gursoy (Yale University); Haixu Tang (Indiana University, Bloomington)	**BSN Special Session # 1:** Automated Dietary Monitoring **Chair:** Oliver Amft (Friedrich-Alexander University Erlangen-Nuernberg)
10:20-10:40	**Coffee Break** **Location: Main Hall AB**		
10:40-11:25	**_Keynote Speaker:_** _James L. Madara (American Medical Association):_ _"The Future of Healthcare and Implications for Digital Health"_ **Location: Main Hall AB**		
11:25-12:40	**Lunch** **Clinical/Translational Panel** James Madara (AMA (American Medical Association)); Robert Barish (University of Illinois at Chicago); Karl Kochendorfer (University of Illinois Hospital & Health Sciences System); Justin Starren (Northwestern University) **Moderator**: Jie Liang (University of Illinois at Chicago) **Location: Main Hall AB**		
12:40-14:10	**BHI Session # 6:** Imaging Informatics I **Chairs:** Jonas E Malmsten (Weill Cornell Medicine & Pace University); Diego Sona (Istituto Italiano di Tecnologia)	**BHI Special Session # 4:** Wearable Sensor Informatics for Cardiopulmonary Monitoring **Chairs:** Omer Inan (Georgia Institute of Technology); Jin-Oh Hahn (University of Maryland)	**BSN Session # 4:** Medical and Wellness Applications from Pre-natal Health to Elderly Care **Chairs:** Paolo Bonato (Harvard Medical School); John Lach (University of Virginia)
14:10-14:25	**Coffee Break** **Location: Main Hall AB**		
14:25-15:55	**_Keynote Speakers:_** _Susan Tousi (Vice President of Product Development at Illumina, Inc.):_ _"Advancing Genomics through Integrated Informatics"_ _David Duffy (Quanterix Corporation):_ _"The Use of Single Molecule Detection Technologies to Define Molecularly the Continuum from Health to Disease"_ **Location: Main Hall AB**		
16:00-18:10	**Special Session** on Rehabilitation Informatics **Moderator:** James Patton (University of Illinois at Chicago)	**Rapid Fire Session # 2** **Chairs (BHI)**: Misha Pavel, (Northeastern Univ); Omer Inan, (Georgia Tech) **Chairs (BSN)**: Woon-Hong Yeo, (Georgia Institute of Technology); Bobak Mortazavi (Texas A&M) **Location: Main Hall AB**	
18:10-19:10	**Poster Session # 2** **Location: Main Hall C**		
19:20-20:20	BHI OC Meeting		BSN OC/TC Meeting (Closed Meeting)

Program at a Glance – Wednesday, May 22nd

Wednesday, May 22, 2019 - Schedule		
MEETING ROOM DE	**MEETING ROOM GH**	**MEETING ROOM F**
7:00-16:00 — **Registration** Location: Foyer		
8:00 – 8:45 — ***BHI-BSN Joint Keynote Speaker:*** *John Rogers (Northwestern University):* *"Soft Electronic and Microfluidic Systems for the Skin"* Location: Main Hall AB		
9:00-10:30 **BHI Special Session # 5**: Decision-Support Computing by Data-Driven and AI-based Approaches for Healthcare **Chairs:** Guillaume Boulelux (University of Lyon); Sondes Chaabane (Valenciennes University)	**BHI Session # 7:** Imaging Informatics II **Chairs:** Said Pertuz (Universidad Industrial de Santander); Ronald J Nowling (Milwaukee School of Engineering)	**BSN Special Session # 2:** Body Sensor Networks and Machine Learning for Mental Health **Chairs:** Benny Lo (Imperial College London); Jeff Palmer (Massachusetts Institute of Technology)
10:30-10:45 — **Coffee Break** Location: Main Hall AB		
10:45-11:30 — ***Keynote Speaker:*** *Joshua A. Gordon (National Institute of Mental Health (NIMH)):* *"Opportunities and Challenges in Computational Psychiatry"* Location: Main Hall AB		
11:30-12:15 — **Industry Showcase** **Moderators:** Julien Penders (Bloomlife); Shuayb Zarar (Microsoft); Louis Atallah (Philips) Location: Main Hall AB		
12:15-13:30 — **Lunch** **Meeting with Editors-in-Chief** Dimitris Fotiadis (EiC, IEEE Journal of Biomedical and Health Informatics) Xiaochuan Pan (EiC, IEEE Transactions on Biomedical Engineering) Stephen Wong (EiC, Elsevier Computational Medical Imaging and Graphics) **Moderator:** May Wang (Georgia Tech) Location: Main Hall AB		
13:30-15:00 **BHI Special Session # 6:** Medical Imaging Informatics - Advances and Trends **Chairs:** Joel Saltz (Stony Brook University); Andreas S. Panayides (University of Cyprus)	**BHI Session # 8:** Behavioral & Sensor Informatics **Chairs:** Terumi Umematsu (Massachusetts Institute of Technology & NEC Corporation); Soyoung Lee, Karam Choi and Sung Hyun Nam (Samsung Advanced Institute of Technology, Samsung Electronics)	**BSN Session # 5:** Mental Health, Cognitive Load and Wellbeing **Chairs:** Bjoern Eskofier (Friedrich-Alexander University); Sunghoon Ivan Lee (University of Massachusetts Amherst)
15:00-15:15 — **Coffee Break** Location: Main Hall AB		
15:15-16:45 **BHI Special Session # 7:** Internet of Things and Machine Learning for Health Informatics **Chairs:** Wei Chen (Fudan University); Benny Lo (Imperial College London)	**BHI Session # 9:** Clinical & Public Health Informatics **Chairs:** Nitesh Chawla (University of Notre Dame); Ozgur Ozmen and Laura Pullum (Oak Ridge National Laboratory)	**BSN Special Session # 3:** Student Colloquium **Expert Panel Chair:** John Rogers (Northwestern University); **Panelists:** Jeff Palmer (MIT); Reed Hoyt (USARIEM); John Lach (U of Virginia); **Moderator:** Carmen Poon (The Chinese University of Hong Kong)
16:50-17:40 — ***Closing Ceremony and Awards Presentation Ceremony*** Location: Main Hall AB		

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Keynote Speakers

Neurons in Pathology through the Lens of Multi-omics and Data Analytics

Date: Monday, May 20

Time: 8:30 – 9:15

Shankar Subramaniam
Joan and Irwin Jacobs Endowed Chair in Bioengineering and Systems Biology
Distinguished Professor of Bioengineering, Computer Science and Engineering, Cellular and Molecular Medicine, and NanoEngineering
University of California San Diego

Abstract: Advances in stem cell engineering, omics technologies and data sciences offer a unique scope for deciphering the myriad ways molecular circuits dysfunction in pathologies of the brain. Recently, we have developed and explored iPSC-derived neurons from familial Alzheimer's disease patients using a systems-level, multi-omics approach, identifying disease-related endotypes, which are commonly dysregulated in patient-derived neurons and patient brain tissue alike. By integrating RNA-Seq, ATAC-Seq, and ChIP-Seq approaches, we determined that the defining disease-causing mechanism of AD is de-differentiation of neurons, driven primarily through the REST-mediated repression of neuronal lineage specification gene programs and the activation of cell cycle reentry and non-specific germ layer precursor gene programs concomitant with modifications in chromatin accessibility. Strikingly, our reanalysis of previously-generated AD-patient brain tissue showed similar enrichment of neuronal repression and de-differentiation mechanisms. Surprisingly, our earlier work on glioblastoma also showed de-differentiation and initiation of some of the shared diseased endotypes as common features. We postulate that de-differentiation and reprogramming are hallmark mechanisms of numerous pathologies, arguably genetically evolved to serve as protection mechanisms.

Bio: Shankar Subramaniam is a Distinguished Professor of Bioengineering, Computer Science and Engineering, Cellular and Molecular Medicine, Chemistry and Biochemistry and Nano Engineering. He holds the inaugural Joan and Irwin Jacobs Endowed Chair in Bioengineering and Systems Biology. He is a Fellow of the AIMBE and AAAS and the current President of IEEE EMBS. He has numerous awards for this scientific contributions including the UCSD Faculty Excellence Award for Research, the Genome Technology All Star Award, the Association of Lab Automation Award, and the Smithsonian Foundation Innovation in Computing Award.

How Computational Modeling Drove Revolution in Cardiovascular Medicine

Date: Monday, May 20

Time: 9:15 – 10:00

Elazer R. Edelman
Institute for Medical Engineering and Science
Massachusetts Institute of Technology, Cambridge, MA, USA

Abstract: The burgeoning development of new technologies presents an interesting set of problems, especially in the health care arena. Federal regulatory agencies, industry, academia and constituency support groups are faced with the dilemma of providing the general population with the greatest and earliest exposure to technology without putting them at risk of premature product introduction – the tension between above all do no harm and rush to treat. It has become impossible to run clinical trials for long enough to identify rare, but potentially fatal events, and not impede technology transfer. Preclinical models are artificial and similarly constrained to consider only a subset of states. Only computational in silico models can embody the conceptual framework of device and drug interaction with pathology states, and in reasonable time simultaneously consider multiple permutations and combinations of anatomic structures, physiologic phenomena, pathologic states and possible interventions, device and drugs.

Nowhere are these issues more acute than in the cardiovascular space – where diseases and dysfunction are responsible for the greatest causes of morbidity and mortality around the world. Innovation in every phase of live and medicine has reduced death from cardiovascular disease four-fold in the last 60 years. As we rush to sustain this momentum the balance of boldness and caution is increasingly threatened. At every stage computational modeling has played a role – critical to the understanding normal cardiac and vascular anatomy and physiology, characterization of the nature of disease, creation of innovative interventions, and delineation of response to these technologies.
The development, use and teaching of the discipline of modeling has evolved with insight into cardiovascular biology and medicine. Pioneers like Leonardo Da'Vinci helped make anatomy a scientific investigation simultaneous with development of quantitative methods; like his use of particle velocimetry tracking blades of grass flowing through fluid filled glass models of the heart and aorta. The last five centuries have seen what Howard Lord Florey noted was the concomitant synergistic development of science and technology. In this Florian paradigm new scientific insights advance our knowledge of disease, leading to development of new therapies and new devices which in turn require quantitative characterization of effect for full definition of their safety and efficacy.

Our obligation is to harness computational modeling to meld biology and engineering, medicine and science, for only then can we continue to advance health, educate communities and suggest lifestyle modification, produce novel medications based on deep insights and offer innovative interventions to improve the quality of life for all.

Bio: Elazer R. Edelman is Edward Poitras Professor Medical Engineering and Science MIT, Professor of Medicine Harvard Medical School, and Senior Attending Physician Brigham and Women's Hospital. He directs MIT's Institute for Medical Engineering and Sciences dedicated to applying physical sciences to biologic processes and disease mechanisms, and home to graduate and medical doctoral degrees programs. His research interests meld medical and scientific training leveraging pathophysiologic insight to improve clinical decision-making and device design.

Integrating and Presenting Patient Data for Personalized Cancer Healthcare

Date: Monday, May 20

Time: 14:45 – 15:30

Ketan Paranjape
VP Diagnostics Information Solutions
Roche Diagnostics Corporation

Abstract: Medicine has become an information business, driven by data from new technologies, especially genomics and imaging, as well as from new sources, like wearables and IoT. Accordingly, excellence in patient care, especially for complex diseases, requires integrating, processing and presenting these data to care-giver teams. Roche is aggressively entering this field, by leveraging its breadth and depth of medical and technical expertise, to develop and commercialize a Decision Support portfolio of workflow and decision support software products. The NAVIFY Tumor Board workflow solution, collects and combines patient data integrated from multiple silos of in treatment center, including EMR, PACS and pathology, and presents them in a single dashboard so cross-functional oncology care teams can review and agree on optimal treatment plan for patients. This presentation will give an overview of the new information challenges in clinical decision-making, and use the NAVIFY Tumor Board as an example of solutions that will become more prevalent across medicine.

Bio: Ketan is the VP of Diagnostics Information Solutions at Roche and his team is focused on harnessing the power of data, diagnostics and other critical information to support better clinical decisions. Prior to this role he was a Managing Director at Health2047 and General Manager of Life Sciences at Intel Corp. He has been a member of the US Health IT committee on Precision Medicine, and part of numerous taskforces at AAAS-FBI-UNICRI, ITU and WHO. He has an MBA and MS and is a certified Paramedic.

Wearable Sensors, Smart Phones, and Machine Learning: Impact on Clinical Care and Clinical Trials

Date: Tuesday, May 21

Time: 8:00 – 8:45

Arun Jayaraman
Director Max Nader Center for Rehabilitation Technologies & Outcomes Research,
Director & Business Development Officer, Office of Translational Research, Shirley Ryan AbilityLab,
Associate Professor Department of Physical Medicine & Rehabilitation,
Department of Physical Therapy & Human Movement Sciences,
Northwestern University

Abstract: Machine learning algorithms that use data streams captured from wearable sensors and smart phones have the potential to automatically detect disease symptoms and inform clinicians about the progression or regression of disease. We will discuss on how to design, implement clinical care or research with wearable sensors. The discussion will touch upon on choosing the number and type of sensors to place on an individual, which location on the human body is appropriate to detect symptoms in highly sensitive manner. Furthermore, we will talk about how much data is required or is sufficient to detect symptoms. Does increasing the amount of training data in each individual or adding more individuals lead to improved symptom detection? Which clinical tests or functional behaviors are best suited for symptom detection? We will discuss whether every data analysis requires advanced techniques like convolutional neural networks or other simpler statistical ensembles work to detect symptoms and its progression in each individual. Finally, we will talk about our smart phone technology can be used monitor disease and mobility at home and in the community and inform clinicians remotely the state of the individual under their care.

Bio: Dr. Arun Jayaraman's work primarily focuses on developing and executing both investigator-initiated and industry-sponsored research in assistive and adaptive technologies to treat physical impairments. He conducts all of his outcomes research using advanced wearable patient monitoring wireless sensors and novel machine learning techniques, in addition to the traditional performance-based and patient-reported outcome measures. He collaborates both nationally and internationally with many academic and industrial organizations and is internationally recognized in the field of wearable technologies.

The Future of Healthcare and Implications for Digital Health

Date: Tuesday, May 21

Time: 10:40 – 11:25

James L. Madara, MD
CEO, American Medical Association

Abstract: Healthcare in the USA consumes 18% ($3.5 Trillion) of the national GDP. As this cost has increased over the last half century, simultaneously there has been a massive shift in disease burden from episodic/acute to chronic disease (chronic disease now accounts for >80% of the healthcare spend). Yet the structure of medical school curricula/ongoing learning, as well as the structure of the health care system overall have only modestly adapted to these striking changes in the type of disease the country faces. In parallel, the digital revolution, remote monitoring, telemedicine, and an astounding growth in health data are edging into healthcare, but our "system" remains fragmented and siloed with poor incorporation of clinical data organization, interoperability, and data liquidity. The AMA has approached these problems by: developing and piloting the medical school and educational networks of tomorrow, creating new connected approaches to chronic disease, and defining how one can turn this non-system into more of a authentic system. Doing this requires rethinking the use of digital environments and, in particular, creating advances in the organization and liquidity of clinical data. Accomplishing this required the AMA to launch an independently operating Silicon Valley innovation company (Health2047.com) which has successfully launched companies with efforts ranging from clinical data liquidity (Akiri.com) to "uberization" of the approach to chronic disease (First Mile Care.com); while, at AMA headquarters in Chicago, producing new approaches to clinical data organization (https://www.ama-assn.org/amaone/integrated-health-model-initiative-ihmi), a digital network to connect entrepreneurs with physicians having like interests (https://innovationmatch.ama-assn.org) , and a digital medicine advisory group (https://www.ama-assn.org/practice-management/digital/digital-medicine-payment-advisory-group) to provide a more disciplined approach to the digital space in medicine.

Bio: James L. Madara, MD, is CEO of the American Medical Association. His career began with 20+ years at Harvard where he received clinical and research training, served as a tenured professor of pathology and was director of the NIH-sponsored Harvard Digestive Disease Center. After five years as chair of pathology (Emory), Madara served as the Thompson Distinguished Service Professor and dean of the University of Chicago Pritzker School of Medicine, and as CEO of the University of Chicago Hospitals. Along with his current position, Madara is chairman of Health2047 Inc. An independent C-corporation, Health2047 is a San Francisco-based design firm whose mission is to help advance the AMA's goal of improving the health of the nation through innovative solutions.

Advancing Genomics through Integrated Informatics

Date: Tuesday, May 21

Time: 14:25 – 15:10

Susan Tousi
Senior Vice President of Product Development
Illumina, Inc

Abstract: Due to advances in nanofabrication, chemistry, protein engineering, and optical systems, we are generating volumes of genomic sequence data at a rate never seen before. In fact, we have only begun to scratch the surface having sequenced less than 0.01% of all species on Earth, and less than 0.02% of the human population. These sequences can help us identify pathogenic species for health and food safety, rapidly diagnose babies with rare genetic diseases, inform therapeutic decisions for patients facing a cancer diagnosis, tell us about who we are, where we came from, and how we can better manage our own health. As incredible as these insights are, they are based on characterizations of less than 1% of the human genome. The complexity and volume of genomic information will require multiple sophisticated and scalable computational methods along the way from a tissue sample to a scientific breakthrough in order to achieve a more complete understanding of the contribution of the genome to biology. The integration of large-scale genomic sequencing power with advanced informatics, including a common data sharing framework and AI capabilities, is a critical next frontier in the mission to fully unlock the power of the genome to advance human health.

Bio: Susan Tousi is Senior Vice President of Product Development at Illumina, Inc., a company on a mission to improve human health by unlocking the power of the genome through delivering market and technology leading DNA sequencers. Illumina is a global company headquartered in San Diego, California. Susan is responsible for Illumina's global engineering, consumables, sequencing applications, software and informatics development efforts, ensuring Illumina's scientists and engineers continue the culture of innovation and product excellence that has been a hallmark of Illumina.

Susan has more than 25-years of R&D and business leadership at Fortune 100 technology companies and within the life sciences industry. Formerly, Susan was as a Corporate Vice President and General Manager for Eastman Kodak's Consumer Inkjet Systems organization. Prior to joining Kodak, Susan was an R&D program manager for Phogenix Imaging LLC, a joint venture start-up of Hewlett-Packard and Kodak. She previously spent 10 years with Hewlett-Packard in technical and management roles.

Susan holds an MBA degree from UCLA's Anderson School of Management and a B.S. in Engineering Science and Mechanics from Pennsylvania State University. Along with many academic honors, in 2018, Susan was elected to the National Academy of Engineers, one of our nation's "highest professional distinctions accorded to an engineer."

The Use of Single Molecule Detection Technologies to Define Molecularly the Continuum from Health to Disease

Date: Tuesday, May 21

Time: 15:10 – 15:55

David Duffy
Chief Technology Officer and Senior Vice President of Research and Development
Quanterix Corporation

Abstract: Our goal at Quanterix is to develop technologies to reliably measure molecular markers at extremely low concentrations in blood (and other fluids) that, in many cases, are undetectable using conventional technologies. These measurements provide unique insight into the role of biomarkers in human health, and has enabled researchers and clinicians to better characterize the continuum between health and disease. The resolution of single analyte molecules provides the ultimate analytical limit for a biomarker in blood, so we have focused on the development of robust single molecule detection technologies. In this presentation, we will describe the development of single molecule arrays (Simoa) for the detection of proteins at subfemtomolar concentrations, and their use in a number of research and clinical application areas. In particular, the use of Simoa to determine neurological health by profiling markers in blood, and the progress towards blood tests for diseases such as multiple sclerosis and Alzheimer's disease will be discussed. The ultimate goal of these technologies is to rapidly provide accurate and precise molecular profiles directly to humans. To this end, we will discuss the technologies required to enable the measurement of single molecule biomarker profiles at the point of care and, ultimately, in a wearable device.

Bio: David C. Duffy, PhD, is Chief Technology Officer and Senior Vice President of Research and Development at Quanterix Corporation. Dr. Duffy joined Quanterix in 2007 and leads the team of scientists and engineers developing its Single Molecule Array (Simoa) technology. Dr. Duffy was previously at Surface Logix, Gamera Biosciences, and Unilever. Dr. Duffy was a postdoctoral fellow at Harvard University, and was the first Sir Alan Wilson Research Fellow of Emmanuel College, University of Cambridge. Dr. Duffy obtained his doctoral and bachelor degrees at the University of Cambridge. Dr. Duffy has 20 U.S. patents and more than 30 publications in the fields of surface chemistry, microfluidics, and single molecule diagnostics.

Soft Electronic and Microfluidic Systems for the Skin

Date: Wednesday, May 22

Time: 8:00 – 8:45

John A. Rogers (Joint Keynote)
Simpson/Querrey Professor
Northwestern University

Abstract: Recent advances in materials, mechanics and manufacturing establish the foundations for high performance classes of electronics and other microsystems technologies that have physical properties precisely matched those of the human epidermis. The resulting devices can integrate with the skin in a physically imperceptible fashion, to provide continuous, clinical-quality information on physiological status. This talk summarizes the key ideas and presents specific examples in wireless monitoring for neonatal intensive care, and in capture, storage and biomarker analysis of sweat.

Bio: Professor John A. Rogers is the Louis Simpson and Kimberly Querrey Professor of Materials Science and Engineering, Biomedical Engineering and Medicine, with affiliate appointments in Mechanical Engineering, Electrical and Computer Engineering and Chemistry, where he is also Director of the newly endowed Center for Bio-Integrated Electronics. He has published more than 650 papers, is a co-inventor on more than 100 patents and he has co-founded several successful technology companies. His research has been recognized by many awards, including a MacArthur Fellowship (2009), the Lemelson-MIT Prize (2011), and the Smithsonian Award for American Ingenuity in the Physical Sciences (2013) – and most recently the MRS Medal from the Materials Research Society (2018). He is a member of the National Academy of Engineering, the National Academy of Sciences, the National Academy of Inventors and the American Academy of Arts and Sciences.

Opportunities and Challenges in Computational Psychiatry

Date: Wednesday, May 22

Time: 10:45 – 11:30

Joshua A. Gordon
Director, National Institute of Mental Health (NIMH)
Chief, Integrative Neuroscience Section
National Institute of Neurologic Disorders and Stroke (NINDS)

Abstract: Joshua A. Gordon, M.D., Ph.D., Director of the National Institute of Mental Health, will provide an overview of challenges and opportunities in mental health research. Dr. Gordon will present emerging approaches and technologies, and future directions for this multidisciplinary field. In this era of unprecedented opportunity, Dr. Gordon will highlight the importance of cross-disciplinary, integrative approaches to address the vast complexities associated with mental illnesses as we move closer to our goal of finding effective treatments and therapies.

Bio: Joshua A. Gordon, M.D., Ph.D. is the Director of the National Institute of Mental Health (NIMH), the lead federal agency for research on mental disorders. He oversees an extensive research portfolio of basic and clinical research that seeks to transform the understanding and treatment of mental illnesses, paving the way for prevention, recovery, and cure. Dr. Gordon pursued a combined M.D.-Ph.D. degree at the University of California, San Francisco (UCSF). Medical school coursework in psychiatry and neuroscience convinced him that the greatest need, and greatest promise, for biomedical science was in these areas. During his Ph.D. thesis with Dr. Michael Stryker, Dr. Gordon pioneered the methods necessary to study brain plasticity in the mouse visual system. Upon completion of the dual degree program at UCSF, Dr. Gordon went to Columbia University for his psychiatry residency and research fellowship because of the breadth and depth of the research opportunities there. Working with Dr. Rene Hen, Dr. Gordon and colleagues studied the role of the hippocampus, a brain structure known to be important for memory and emotional processes associated with anxiety and depression. He joined the Columbia faculty in 2004 as an assistant professor in the Department of Psychiatry. Dr. Gordon's research focuses on the analysis of neural activity in mice carrying mutations of relevance to psychiatric disease. His lab studied genetic models of these diseases from an integrative neuroscience perspective, focused on understanding how a given disease mutation leads to a behavioral phenotype across multiple levels of analysis. To this end, he employs a range of systems neuroscience techniques, including in vivo imaging, anesthetized and awake behavioral recordings, and optogenetics, which is the use of light to control neural activity. His research has direct relevance to schizophrenia, anxiety disorders, and depression. In addition to his research, Dr. Gordon was an associate director of the Columbia University/New York State Psychiatric Institute Adult Psychiatry Residency Program, where he directed the neuroscience curriculum and administered research training programs for residents. Dr. Gordon also maintained a general psychiatric practice, caring for patients who suffer from the illnesses he studied in his lab at Columbia. Dr. Gordon's work has been recognized by several prestigious awards, including the Brain and Behavior Research Foundation – NARSAD Young Investigator Award, the Rising Star Award from the International Mental Health Research Organization, the A.E. Bennett Research Award from the Society of Biological Psychiatry, and the Daniel H. Efron Research Award from the American College of Neuropsychopharmacology.

Meeting with Funding Agencies Panel

The plenary 75-minute "Meeting with Funding Agencies" panel will be held on **Monday, May 20th from 13:25 to 14:40** and aims to provide a forum for large community to learn exciting topics in biomedicine and their related technological challenges perceived by leading funding agencies. The panelists from NIH, NSF, and Philanthropy Foundation will present research programs that support informatics, sensors, and bioengineering effort in addressing these challenges; and will provide guidelines and tips on proposal review process. In addition, this panel will provide a platform for the panelists to engage a dialogue with the biomedical and health informatics (BHI) and body sensors networks (BSN) communities on emerging topics that need future investment. The format of the panel will be for each panelist will speak for 15 minutes. Then the floor will open for Q&A.

Wendy Nilsen, Ph.D.
Program Director, National Science Foundation

Wendy Nilsen, Ph.D. is a Program Director for the Smart and Connected Health Program in the Directorate for Computer & Information Science & Engineering at the National Science Foundation. Her work focuses on the intersection of technology and health. This includes a wide range of methods for data collection, data analytics and turning data to knowledge. Her interests span the areas of sensing, analytics, cyber-physical systems, information systems, big data and robotics, as they relate to health. More specifically, her efforts include: serving as cochair of the Health Information Technology Research and Development community of practice of the Networking and Information Technology Research and Development Program; the lead for the NSF/NIH Smart and Connected Health announcement; convening workshops to address methodology in mobile technology research; serving on numerous federal technology initiatives; and, leading training institutes. Previously, Wendy was at the NIH Office of Behavioral and Social Sciences Research (OBSSR).

Suzana Petanceska, Program Officer, NIH/NIA

Dr. Petanceska joined the National Institute on Aging in 2005, as a program director in the Division of Neuroscience. During her tenure at the NIA she has been overseeing and developing a number of research portfolios and programs in basic and translational research for Alzheimer's disease. She has been instrumental for the development of NIA's AD Translational Research program, the Epigenomics of AD portfolio and the Accelerated Medicines Partnership for AD (AMP-AD) – Target Discovery and Preclinical Validation Project. Since 2012 she has been leading a number of NIA's strategic planning activities related to achieving the research goal of the National Plan to Address Alzheimer's: to prevent and treat AD by 2025.

Jean (Xin) Yuan, MD., PhD., Scientific Review Officer, Biomedical Computing and Health Informatics Study Section (BCHI), Healthcare Delivery and Methodologies (HDM) IRG

Jean (Xin) Yuan, MD, PhD is the Scientific Review Officer at the Center for Scientific Review (CSR) at the National Institutes of Health (NIH). She oversees the review of applications for the Biomedical Computing and Healthcare Informatics (BCHI) Study Section and Small Business SBIR/STTR review panel, which cover the topics in digital health/eHealth and mobile health (mHealth), including the development and application of computing, informatics, and big data analytics methodology and biosensors or wearable/smart technology to improve human health and assist clinical decision support. Prior to joining the CSR she worked at Georgetown University, UniProt protein database, and GlaxoSmithKline (GSK) R&D where she played key role in using multi-platform biological and clinical data in precision medicine of cardiovascular and immunology diseases and cancers.

Dr. Elebeoba May, Program Director for the Systems and Synthetic Biology (SSB) Cluster, NSF Biological Sciences Directorate

Dr. Elebeoba May currently serves as a Program Director for the Systems and Synthetic Biology (SSB) Cluster in the Division of Molecular and Cellular Biosciences within the NSF Biological Sciences Directorate. The SSB program supports highly interdisciplinary research that uses the tools of systems and synthetic biology to understand complex interactions within biological systems across different scales. As an Associate Professor of Biomedical Engineering at the University of Houston, Dr. May's research focuses on the integration of computational and experimental platforms for the development of multi-scale, predictive models of host-pathogen interactions, microbial communities, and genetic information processing systems.

IEEE bhi-bsn

University of Illinois at Chicago - Chicago, Illinois, USA
May 19-22, 2019

Monday, May 20
5:05 PM – 5:40 PM

Location: Main Hall C

IEEE EMBS BHI-BSN 2019
Networking with Leaders

Paolo Bonato
Harvard Medical School, USA

Wei Chen
Fudan University, China

Dimitris Fotiadis
University of Ioannina, Greece

Mark Gerstein
Yale University, USA

Daniela Giordano
Univ of Catania, Italy

Omer Inan
Georgia Tech, USA

Roozbeh Jafari
Texas A&M University, USA

John Lach
University of Virginia, USA

Benny Lo
Imperial College London, UK

Ketan Paranjape
Roche, USA

Carmen Poon
The Chinese Univ of Hong Kong, Hong Kong
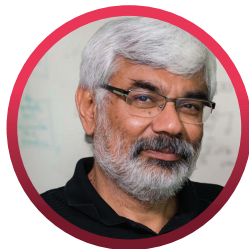
Shanker Subramaniam
UCSD, USA

Haixu Tang
Indiana University Bloomington, USA

Susan Tousi
Illumina, USA

May D. Wang
Georgia Tech, USA

https://www.bhi-bsn-2019.org/student-activities

BHI 2019 Co-Chairs

Jie Liang
Univ of Illinois at Chicago, USA

Dimitrios I. Fotiadis
JBHI EiC, Univ of Ioannina, Greece

BHI-BSN Networking With Leaders Chair

Ahmed A. Metwally
Stanford University

BSN 2019 Co-Chairs

Carmen Poon
The Chinese Univ of Hong Kong, Hong Kong SAR

John Rogers
Northwestern University, USA

IEEE
Advancing Technology for Humanity

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Clinical/Translational Panel

Date: Tuesday, May 21

Time: 11:25 – 12:40

James L. Madara, MD, is CEO of the American Medical Association. His career began with 20+ years at Harvard where he received clinical and research training, served as a tenured professor of pathology and was director of the NIH-sponsored Harvard Digestive Disease Center. After five years as chair of pathology (Emory), Madara served as the Thompson Distinguished Service Professor and dean of the University of Chicago Pritzker School of Medicine, and as CEO of the University of Chicago Hospitals. Along with his current position, Madara is chairman of Health2047 Inc. An independent Corporation, Health2047 is a San Francisco-based design firm whose mission is to help advance the AMA's goal of improving the health of the nation through innovative solutions.

Dr. Robert A. Barish, a distinguished physician and academic leader, is vice chancellor for health affairs at UIC. He oversees the University of Illinois Hospital & Health Sciences System (UI Health), a clinical enterprise that includes a 465-bed tertiary care hospital, 22 outpatient clinics, and 13 Mile Square Health Center locations, which are Federally Qualified Health Centers. Dedicated to the pursuit of health equity, UI Health also includes the seven UIC health science colleges, including campuses in Chicago, Peoria, Quad Cities, Rockford, Springfield, and Urbana. Prior to coming to UIC, Dr. Barish served as chancellor of the LSU Health Sciences Center at Shreveport, and spent 24 years at the University of Maryland School of Medicine, where he served as chief of emergency medicine as he built a nationally recognized program.

Karl Kochendorfer, MD, FAAFP is the Assistant Vice Chancellor for Health Affairs, Chief Health Information Officer (CHIO) and Associate Chief Medical Officer (CMO) at the University of Illinois Hospital & Health Sciences System (UI Health) and Associate Professor of Clinical Family Medicine at the University of Illinois at Chicago (UIC). He is a practicing primary care clinician who also delivers babies and cares for hospitalized patients. At UI Health, Dr. Kochendorfer has founded and led many enterprise initiatives, including Meaningful Use (MU), Electronic Medical Records (EMR), Clinical Documentation Improvement (CDI), Clinical Guideline and Protocol Oversight, Clinical Decision Support (CDS), Patient Portal and Data Governance Committees and Teams.

Justin Starren, M.D., Ph.D., FACMI, is Professor of Preventive Medicine and Medical Social Sciences at the Northwestern University Feinberg School of Medicine. He is founding Chief of the Division of Health and Biomedical Informatics, Deputy Director of the Northwestern University Clinical and Translational Sciences Institute (NUCATS) and Director of the Feinberg Center for Data Science and Informatics (CDSI). Dr. Starren's research focuses on the translation of computer and informatics research into real-world solutions. Dr. Starren has led the EHR integration workgroup of the Electronic Medical Records and Genomics (eMERGE) project, focusing on the integration of genomic data into the EHR to support precision medicine. He is PI of a nine-site consortium integrating patient reported outcomes data into EHRs: EHR Access to Seamless Integration of PROMIS (EASI-PRO). He also leads the doctoral programs in Health and Biomedical Informatics, serves on the university Big Data Taskforce and oversees a variety of informatics, research computing, and data sciences for NUCATS.

Industry Showcase

Date: Wednesday, May 22

Time: 11:30 – 12:15

The organizers of BSN and BHI are proud to present the second edition of our industry showcase, highlighting some of the most innovative new products in the market. We are delighted that one of last year's finalists translated their innovation into a successful start-up and are excited to see more innovative products this year.

During last year's industry showcase, Josep Sola, then at CSEM, demonstrated his revolutionary product that unobtrusively measures an individual's blood pressure at the wrist. It combines optical sensors (commonly used to track heart-rate in today's wearables), and clinically validated software algorithms. Josep is now co-Founder and CTO of Aktiia who received CHF 4M ($4M) in seed-funding from Silicon Valley and Swiss investors. This year's focus is on **preventive healthcare**. Preventive healthcare consists of measures taken for disease prevention as opposed to disease treatment. We invite companies to present novel solutions for preventive healthcare, including new devices, sensors, predictive analytics, digital tools and software solutions that encourage a healthy lifestyle, reduce the risk of diseases and help keep people healthy and outside the hospital for as long as possible.

The showcase will consist of short pitches followed by a Q&A and an audience vote for the most innovative product award. Online voting will be accessible following the session at the following URL:

https://www.surveymonkey.com/r/BHI-BSN

Participating Companies:

Diagnos
Computed Assisted Retinal Analysis, or CARA system, performs automatic detection of ocular pathologies through analyzing retinal fundus images. The system combines big data with recent advances in the artificial intelligence (A.I.) field in order to detect critical to the vision medical conditions. This information can be used to address and manage important public health issues. The focus of CARA is diabetic retinopathy, however it can be extended to cardiovascular or even neurodegenerative diseases. Having big data processing capabilities, CARA contains the necessary infrastructure in order to be deployed at a global scale.

Protxx
The PROTXX wearable sensor, coupled with a powerful machine learning engine, helps medical professionals monitor, classify, and quantify the onset and progression of injury, medical-treatment, and age-related neurovestibular and musculoskeletal impairments in athletic, elderly, industrial, and military populations, enabling preventive interventions, reduced injury incidence and severity, improved recovery outcomes, and optimal human performance.

Spidersense
SpiderSense is a wearable jacket that provides haptic environmental information to the wearer. In other words, users "feel" the environment on their skin, and therefore can feel objects, obstacles, and people around them.

Mondevices
The MonBaby is an award-winning baby movement monitor, sleep tracking and training product in the form of a wearable button that snaps onto any article of baby clothing. It alerts parents when there is an interruption in breathing or if the baby rolls over. We also working on a mode for sleep training.

HideIT
HideIT Wearables LLC is creating assistive and human augmentation devices for the masses. We specialize in subject-specific device design. Our mission is to circumvent a mass production model and focus on tailor-made, individualized devices. We also supply consulting services to bring your wearable device ideas to a minimally viable product stage.

NowPow
PowRx is a multi-sided SaaS platform that connects patients to the resources they need to get well, stay well, and manage with chronic disease. Using NowPow's comprehensive resource directory, powerful filters, screenings and matching algorithms, care professionals quickly find services that meet patients' basic and self-care needs. Our deep data capture and analytics capability underpins the entire platform, allowing a large and diverse ecosystem of stakeholders to gain important insights about the self-care needs and population health of their community.

Meeting with Editors-in-Chief Panel

Date: Wednesday, May 22

Time: 12:15 – 13:30

The plenary 75-minute "Meeting with EiC" panel aims to share with large community the journals that cover scope of biomedical and health informatics (BHI) and body sensors networks (BSN) research. Specifically, every panelist (Editor in Chief or Managing Editor) will use 15 minutes to present the scope, the growth, and the special opportunities of the specific journal he/she is in charge, and tips on how to get published in that journal. Then the panel will open for Q&A so that this panel will enable EiCs gather input from the large BHI and BSN communities to plan for future special issues to cover emerging topics.

Dimitrios I. Fotiadis (EiC, IEEE Journal of Biomedical and Health Informatics)

Prof. Dimitrios I. Fotiadis received the Diploma degree in chemical engineering from the National Technical University of Athens, Athens, Greece, in 1985, and the Ph.D. degree in chemical engineering and materials science from the University of Minnesota, Minneapolis, in 1990. He is currently a Professor of Biomedical Engineering in the Department of Materials Science and Engineering, University of Ioannina, Ioannina, Greece, where he is also the Director of the Unit of Medical Technology and Intelligent Information Systems, and is also an Affiliated Member of Foundation for Research and Technology Hellas, Institute of Molecular Biology and Biotechnology, Dept. of Biomedical Research. He was a Visiting Researcher at the RWTH, Aachen, Germany, and the Massachusetts Institute of Technology, Boston. He has coordinated and participated in more than 200 R&D funded projects. He is the author or coauthor of more than 250 papers in scientific journals, 450 papers in peer-reviewed conference proceedings, and more than 50 chapters in books. He is also the editor or coeditor of 30 books. His work has received more than 12.000 citations (h-index=57). He is IEEE EMBS Fellow, EAMBES Fellow, member of the Technical Committee of information Technology in Healthcare, Editor in Chief of IEEE Journal of Biomedical and Health Informatics and Associate Editor for Computers in Biology and Medicine. His research interests include multiscale modeling of human tissues and organs, intelligent wearable/implantable devices for automated diagnosis, processing of big medical data, sensor informatics, image informatics, and bioinformatics. He is the recipient of many scientific awards including the one by the Academy of Athens.

Xiaochuan Pan (EiC, IEEE Transactions on Biomedical Engineering)

Xiaochuan Pan is currently Professor of Radiology, Radiation & Cellular Oncology, Committee in Medical Physics, the College, and the University of Chicago Medicine Comprehensive Cancer Center at The University of Chicago. He received the BS (1982) and MS (1985) degrees in physics from Beijing University and the Institute of Physics, Science Academy of China and the MS (1988) and PhD (1991) degrees in physics from The University of Chicago. Following post-doc training in medical imaging from 1992-1994 in the Department of Radiology at The University of Chicago, he was appointed as an Assistant Professor of Radiology before being promoted to Associate Professor and Professor of Radiology in 2001 and 2006.

Stephen Wong (EiC, Elsevier Computational Medical Imaging and Graphics)

Steve has three decades of research dedication in applying informatics, imaging, and experimental biology approaches in solving disease problems. He was the systems architect of the pioneering picture archiving and communication systems (PACS) research program at UCSF and directed clinical product development at Philips Healthcare in 90's. He founded two campus-wide research centers, one for neuroinformatics research at Harvard Medical School and the other for functional and molecular imaging at Brigham and Women's Hospital, including forming their first cyclotron and preclinical imaging facilities in 2000's. Steve is a Professor of Radiology, Neurosciences, Pathology and Laboratory Medicine at Cornell University. He holds John S Dunn Presidential Distinguished Chair at Houston Methodist and serves as Associate Director of Houston Methodist Cancer Center and Director of TT & WF Chao Center for BRAIN at Houston Methodist Hospital. He has been the Editor-in-Chief for Computerized Medical Imaging and Graphics, the very first journal of medical image computing, since 2010. He is a Fellow of IEEE.

BHI Workshops

All workshops will be held Sunday, May 19th at UIC Student Center East.

Title: Workshop on Brain Network Analysis

Presenters: Maggie Cheng (Illinois Institute of Technology)

Overview: The workshop will focus on the study of brain networks. The topics of the workshop include both biomedical signal processing and big data analytics/machine learning, with a necessary addition in connectomics. The modelling, analysis and inference on brain activities from a complex network approach is complementary to the study of neuro-informatics. The workshop will solicit research presentations that address computational models and analytical tools, as well as the use of large-volume, high-dimensional experimental data. Both mathematical modelling and machine learning/artificial intelligence will be covered. The theme of the workshop is consistent with the theme of BHI-2019. It is relevant to two conference tracks, and yet not fully covered by any of the tracks. Therefore, it is necessary to propose a workshop specializing in brain network analysis.

Title: Women in the Biomedical Engineering Workforce: Inspiring new leaders and professional development

Presenters: Maria Teresa Arredondo (Universidad Politécnica de Madrid); Holly Jimison (Northeastern University)

Overview: The goal of this workshop is to stimulate, through the view of different professionals in the Biomedical Engineering research arena, advancing women in the workplace. Women in biomedical and health informatics (BHI) face significant challenges in developing their careers, especially in leadership roles. A workshop focused on women's career development provides important information and resources and helps build a community of women leaders and mentors to support professional growth of our future leaders. The intended audience includes women at all stages in their careers, from students to seasoned veterans, as well as anyone who wishes to mentor women in BHI.

Title: Modelling in bioengineering and bioinformatics

Presenters: Prof. Nenad Filipovic, Faculty of Engineering, University of Kragujevac, Serbia

Overview: Computational methods, big data analytics, machine learning, artificial intelligence, bioinformatics, give opportunity for a patient-specific model in order to improve the quality of prediction for the disease progression into life-threatening events that need to be treated accordingly. Authors will present with advanced research support tools for disease characterization, and the integrative informatics; associations among heterogeneous data, that can improve the predictive power of the patient specific model.

Title: Deep Learning for Computational Genomics and Drug Response Prediction

Presenters: Yufei Huang (The university of Texas at San Antonio); Yidong Chen (The university of Texas at San Antonio)

Overview: The advances and decreasing costs of genome sequencing and other high throughput technologies have led to the creation of large volumes of diverse datasets for biomedical research and drug discovery. This explosion of extensive genomic data provides exciting opportunities for developing machine learning and especially deep learning solutions for the discovery of new knowledge that can be used for better understanding of human pathological conditions and for the development of a more personalized, less toxic and more potent treatment regimen. In this tutorial, we propose to provide comprehensive survey for deep learning models developed for "omics" data and drug response prediction. The goal of the tutorial is to educate audience about the basics of deep learning models, how deep learning can be applied to genomics data to address important biomedical research questions, and how deep learning advances the prediction of drug responses.

Title: Integrating and Modelling Multi-Faceted Daily and Night Sleep Data for Precision Sleep Medicine and Prevention of Sleep Disorders

Presenters: Pangiotis D. Bamidis (Aristotle University of Thessaloniki); Christos A. Frantzidis (Aristotle University of Thessaloniki)

Overview: The workshop aims to present recent advances in the organization of clinical or pragmatic trials involving data acquisition of neurophysiological, biological, sensorial and behavioral data for enabling robust and early identification of sleep and sleep-related breathing disorders at early stages. It welcomes submissions that deal with the issue of multi-modal information fusion in order to result in integrative models capable of providing data regarding the daily activity levels of their users as well as sleep patterns, such as sleep duration, quality and efficiency. Development of sleep analytics derived by the combination of multi-modal fusion with deep learning methods has the potential to provide insight into yet unobserved facets of sleep enabling precision medicine. The workshop aims to provide insight into the following research questions:

• Organizational issues related with unobtrusive, continuous data acquisition outside laboratory/clinical settings. • Integration of features derived from heterogeneous recording modalities (questionnaires, time-series, image and video analysis). • Recent advances in precision sleep modelling and challenges towards precision medicine.

Title: Data Analytics in HealthCare

Presenters: Prof. Themis P. Exarchos (Dept. of Informatics, Ionian University, Corfu, Greece); Mr. Vasileios C. Pezoulas (Unit of Medical Technology and Intelligent Information Systems, Dept. of Materials Science and Engineering, University of Ioannina, Ioannina, Greece)

Overview: This workshop will present new trends on data analytics in healthcare, while it will discuss the significant challenges occurring when managing and analyzing large amounts of data. Current methods, ranging from data harmonization to the application of prediction models for disease management, will be presented. Considering that new technologies have not been holistically validated yet, the workshop will contribute positively to the adoption of new practices in data analytics in healthcare.

BSN Workshops

Title: Bio-Integrated Flexible and Stretchable Electronics for Skin Sensor Networks

Overview: The workshop aims at drawing the state-of-the-art for skin-like technologies by discussing the latest scientific progress and achievements, the open challenges and the opportunities for future directions. As this research area is at the crossroads of several disciplines (including electronics, electromagnetics, mechanics, materials science, chemistry, biology, medicine, ethics) the workshop will offer the opportunity of fruitful contamination among chemical sensors, electromagnetic components and interconnects, energy harvesting and the smart materials and packaging as well as ethical issues.

Organizers: Prof. Gaetano Marrocco (University of Rome Tor Vergata); Dr. Sara Amendola (University of Rome Tor Vergata); Prof. John A. Rogers (Northwestern University).

Title: Using mHealth Technology to Enable the Clinical Trial of the Future

Overview: The adoption of mHealth technologies in clinical trials has recently gained the attention of researchers and clinicians. These technologies facilitate tracking adverse events, improve the reliability of the clinical trial data thus leading to a decrease in the required sample size, and enable effective strategies to achieve optimal adherence to study protocols. Workshop attendees will hear from field experts about how body sensor networks and other mHealth technologies are currently utilized in clinical trials, how data analytics tools are designed to derive clinically relevant information from sensor data, and how clinical trial endpoints can be derived from body sensor data. Besides, attendees will have the opportunity to hear how funding agencies look upon these technologies as key to advance medical research and accelerate the path toward clinical adoption of experimental medical interventions. This one-day workshop will be organized in 4 sessions of 90 min each. During each session, two speakers will discuss complementary aspects of four topics:
1. the potential benefits of adopting mHealth technologies in clinical trials with focus on neurological and cardiorespiratory conditions,
2. the development of mHealth platforms meeting the technical specifications of clinical trials,
3. the design and implementation of machine learning algorithms to derive clinical trial endpoints, and
4. the relevance of mHealth technologies to accelerate the assessment of new clinical interventions.

Organizers: Dr. Paolo Bonato (Harvard Medical School); Dr. Federico Parisi (Harvard Medical School); Dr. Bjoern Eskofier (Friedrich-Alexander University Erlangen-Nuernberg)

Title: Automated Dietary Monitoring 2019

Overview: The objective of ADM is unobtrusive, continuous long-term diet monitoring as well as supporting sustainable diet change. Investigations on body-worn sensors and related analysis algorithms to monitor dietary behavior have gained wide interest in the BSN community. Several early business ventures are picking up ideas. And still, unobtrusive monitoring and intervention systems for diet management are broadly lacking. The technology must be made ready for free-living everyday use, while capturing various behavioral aspects related to intake. ADM'19 will address the following non-exhaustive list of topics:

1. ADM community development, addressing terminology, frameworks, benchmark datasets & challenges, etc.
2. Intake recognition and pattern analysis algorithms (online and offline) leveraging wearable systems, including intake timing, intake material, amount, and further variables.
3. Studies on, and methodologies for technology-supported situative dietary coaching and guidance towards lifestyle changes.
4. Trustworthy evaluation methodologies, in particular those that generalize onto free-living.
5. Opinions of dietitian and coaches on supportive technology and requirements.
6. Presentations of relevant datasets available to other researchers.

Based on the success of the previous years, ADM'19 will again serve as a scientific exchange, discussion, and networking event. ADM'19 will bring together researchers and students actively developing dietary monitoring technology, practitioners, clinicians, and coaches looking for monitoring systems, and everyone interested in the area. The workshop will feature technical and medical/coaching discussion time. A best student contribution will be awarded. In addition, posters and preparation of a position paper will make ADM'19 an exciting event.

Organizers: Prof. Oliver Amft (Chair of Digital Health – FAU Erlangen-Nürnberg); Dr. Samantha Kleinberg (Stevens Institute of Technology); Dr. Benny Lo, (Imperial College London); Dr. Edison Thomaz (University of Texas at Austin).

IEEE bhi-bsn

University of Illinois at Chicago – Chicago, Illinois, USA

May 19-22, 2019

IEEE

Advancing Technology for Humanity

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IEEE EMBS BHI-BSN 2019 Floorplan

Meeting Room I

Meeting Room G-H

Meeting Room F

Meeting Room D-E

2nd Floor Meeting Rooms

Main Entrance

Registration

Main Hall AB
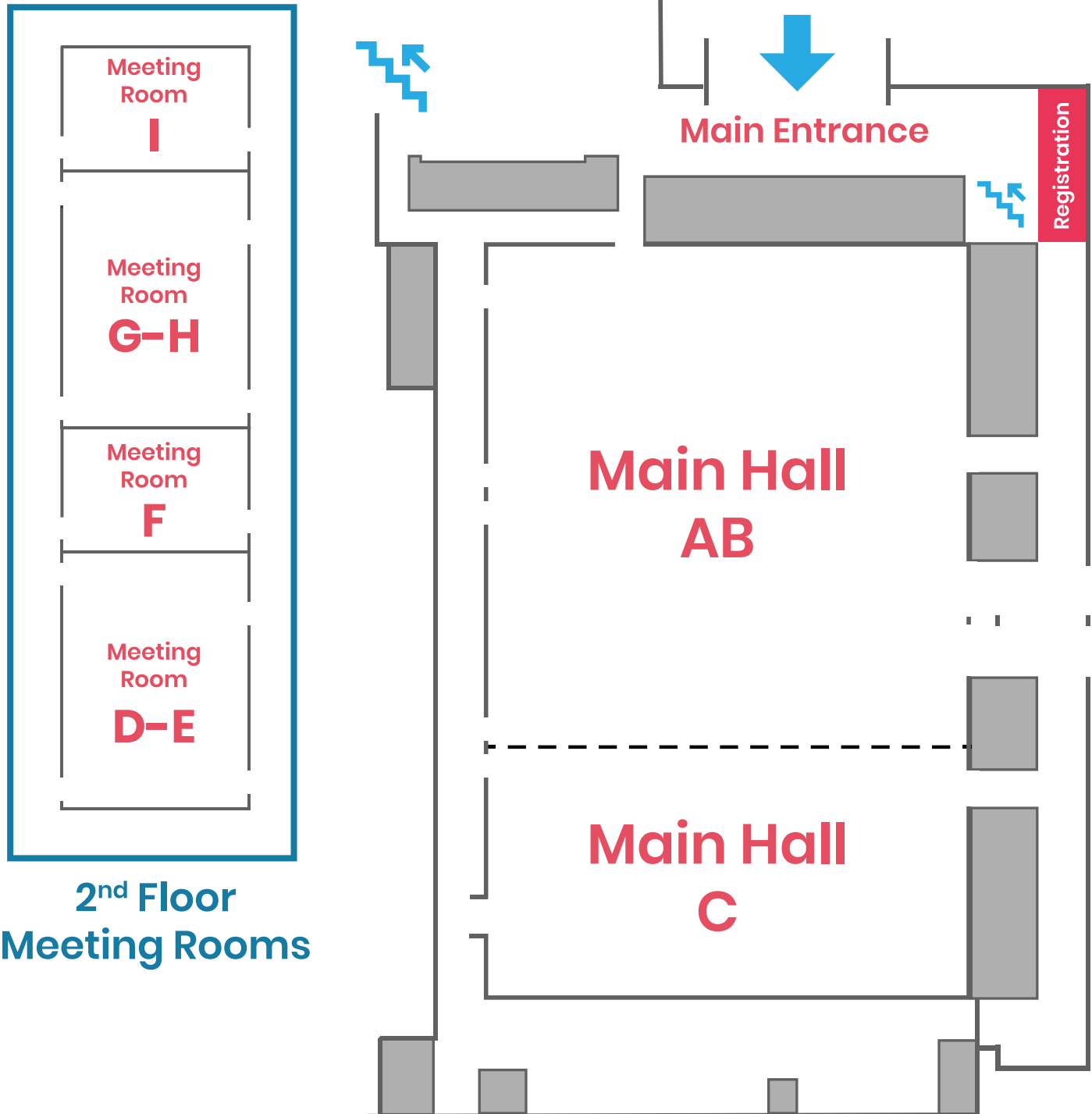
Main Hall C

Monday, May 20

8:00 - 8:15
Opening Welcome
Room: Main Hall AB

Jie Liang - BHI OC Chair, University of Illinois at Chicago
Carmen Poon - BSN OC Chair, The Chinese University of Hong Kong

8:15 - 8:30
Opening Remarks
Room: Main Hall AB

Chancellor Michael D. Amiridis, University of Illinois at Chicago

8:30 - 10:00
Keynote Session 1
Room: Main Hall AB

Keynote Speakers:
Shankar Subramaniam (President of EMBS): "Neurons in pathology through the lens of multi-omics and data analytics"
Elazer R. Edelman (Massachusetts Institute of Technology): "How Computational Modeling Drove Revolution in Cardiovascular Medicine"

10:05 - 11:35
BHI Session #1: Biomedical Signal Processing Informatics I
Room: Meeting Room DE
Chairs: Kai Keng Ang (Institute for Inforcomm Research, A*STAR, Singapore), Taufiq Hasan (Bangladesh University of Engineering and Technology, Bangladesh)

10:05

Towards EEG Generation Using GANs for BCI Applications
Fatemeh Fahimi (Nanyang Technological University & Institute for Infocomm Research, A*STAR, Singapore); Zhuo Zhang (Institute for Infocomm Research, Singapore); Boon W Goh (Nanyang Technological University, Singapore); Kai Keng Ang (Institute for Inforcomm Research, A*STAR, Singapore); Cuntai Guan (Nanyang Technological University, Singapore)

10:20

Symptom-based, Dual-channel LSTM Network for The Estimation of Unified Parkinson's Disease Rating Scale III
Murtadha D. Hssayeni (Florida Atlantic University, USA); Joohi Jimenez-Shahed (Baylor College of Medicine, USA); Michelle A. Burack (University of Rochester Medical Center, USA); Behnaz Ghoraani (Florida Atlantic University, USA)

10:35

Image-based Motor Imagery EEG Classification using Convolutional Neural Network
Tao Yang, Koksoon Phua and Juanhong Yu (Institute for Infocomm Research, Singapore); Thevapriya Selvaratnam, Valerie E. Toh and Wai Hoe Ng (National Neuroscience Institute, Singapore); Kai Keng Ang (Institute for Inforcomm Research, A*STAR, Singapore); Rosa Q So (Institute for Infocomm Research, Singapore)

10:50

A Deviation Analysis Framework for ECG Signals Using Controlled Spatial Transformation
Jiaming Chen, Ali Valehi, Fatemeh Afghah and Abolfazl Razi (Northern Arizona University, USA)

11:05

DeepDDK: A Deep Learning based Oral-Diadochokinesis Analysis Software
Yangyang Wang, Ke Gao, Ashley M. Kloepper, Yunxin Zhao, Mili Kuruvilla-Dugdale and Teresa E. Lever (University of Missouri, USA); Filiz Bunyak (University of Missouri, Columbia, USA)

11:20

End-to-end Sleep Staging with Raw Single Channel EEG using Deep Residual ConvNets
Ahmed Imtiaz Humayun (Bangladesh University of Engineering and Technology & mHealth Research Group, Bangladesh); Asif Shahriyar, Taufiq Hasan and Mohammed Imamul Hassan Bhuiyan (Bangladesh University of Engineering and Technology, Bangladesh)

Monday, May 20

10:05 - 11:35
BHI Special Session #1: Nonparametric Statistics in Omics Applications
Room: Meeting Room GH
Chairs: Ahmed A. Metwally (Stanford University, USA), Alan Perez-Rathke (University of Illinois at Chicago, USA)

10:05
Controlling the false discovery rate in genomics research
Yanrong Ji (Northwestern University, USA); Ramana Davuluri (Northwestern University & Feinberg School of Medicine, USA); Sudesh Pundir (Pondicherry University, India)

10:20
The Digital Biomarker Discovery Pipeline
Jessilyn Dunn, Shenghong Zhao and Ikponmwosa Ogbeide (Duke University, USA); Ryan Runge (University of California, San Francisco, USA)

10:35
Statistical Methods for Analyzing Microbiome Data
Yinglin Xia (University of Illinois at Chicago, USA)

10:50
Nonparametric Longitudinal Analysis of Omics Data
Ahmed A. Metwally and Michael Snyder (Stanford University, USA)

11:05
Bayesian Nonparametric Multi-Population Deconvolution Model for Hi-C Data
Alan Perez-Rathke (University of Illinois at Chicago, USA); Valentina Boeva (Institut Cochin, France); Jie Liang (University of Illinois at Chicago, USA)

11:20
Identifying Somatic Mutation Profiles via Power Law in Variational Autoencoder
Rahul Mehta (University of Illinois at Chicago, USA)

10:05 - 11:35
BSN Session # 1 - Machine learning, deep learning and decision support algorithms
Room: Meeting Room F
Chair: Roozbeh Jafari (Texas A&M University, USA), Karl Friedl (University of California, San Francisco), Benny Lo (Imperial College, United Kingdom (Great Britain))

10:05
Surface-EMG based Wrist Kinematics Estimation using Convolutional Neural Network
Tianzhe Bao and Syed Ali Raza Zaidi (University of Leeds, United Kingdom (Great Britain)); Shengquan Xie (University of Leeds, United Kingdom (Great Britain) & Qingdao University of Technology, P.R. China); Zhi-Qiang Zhang (University of Leeds, United Kingdom (Great Britain))

10:25
Real-time Smartphone-based Sleep Staging using 1-Channel EEG
Abhay Koushik and Judith Amores (MIT Media Lab, USA); Pattie Maes (MIT Media Laboratory, USA)

10:45
Hierarchical Active Learning for Model Personalization in the Presence of Label Scarcity
Annamalai Natarajan (Philips Research, USA); Deepak Ganesan (University of Massachusetts, Amherst, USA); Benjamin M Marlin (University of Massachusetts Amherst, USA)

11:05
Resource-Efficient Wearable Computing for Real-Time Reconfigurable Machine Learning: A Cascading Binary Classification
Mahdi Pedram, Hassan Ghasemzadeh, Seyed Ali Rokni and Marjan Nourollahi (Washington State University, USA); Houman Homayoun (George Mason University, USA)

11:35 - 11:55
Coffee Break
Room: Main Hall AB

Monday, May 20

11:55 - 13:25
BHI Session #2: Biomedical Signal Processing Informatics II
Room: Meeting Room DE
Chairs: RamasubbaReddy Machireddy (IITM, India), Gert Mertes (University of Oxford, United Kingdom (Great Britain) & KU Leuven, Belgium)

11:55
ECG Reconstruction via PPG: A Pilot Study
Qiang Zhu and Xin Tian (University of Maryland, USA); Chau-Wai Wong (North Carolina State University, USA); Min Wu (University of Maryland, College Park, USA)

12:10
ECGNET: Learning Where to Attend for Detection of Atrial Fibrillation with Deep Visual Attention
Sajad Mousavi, Fatemeh Afghah and Abolfazl Razi (Northern Arizona University, USA); Rajendra Acharya (Ngee Ann Polytechnic, Singapore)

12:25
Atrial Fibrillation Detection Using Deep Features and Convolutional Networr
Hamid R. Tizhoosh and Sara Ross-Howe (University of Waterloo, Canada)

12:40
Silent Aspiration Detection in High Resolution Cervical Auscultations
Caroline Yu and Yassin Khalifa (University of Pittsburgh, USA); Ervin Sejdić (Univerisity of Pittsburgh, USA)

12:55
Multiview MAX-VAR canonical correlation approach for enhancing SSVEP based BCIs
Kiran Kumar Guruswamy Ravindran (Indian Institute of Technology Madras, India); RamasubbaReddy Machireddy (IITM, India)

13:10
Predicting the meal macronutrient composition from continuous glucose monitors
Zepeng Huo (Texas A&M University, USA); Bobak Jack Mortazavi (Texas A&M University & Center for Outcomes Research and Evaluation - Yale University, USA); Theodora Chaspari, Nicolaas Deutz, Laura Ruebush and Ricardo Gutierrez-Osuna (Texas A&M University, USA)

11:55 - 13:25
BHI Special Session #2: AI Techniques for Multi-Modality Medical Big Data
Room: Meeting Room GH
Chairs: Raffaele Gravina (University of Calabria, Italy), Ye Li (Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, P.R. China)

11:55
Multi-sensor Data Fusion for Emergency Prediction in Smart BAN-enabled Environments
Raffaele Gravina and Giancarlo Fortino (University of Calabria, Italy)

12:10
Learning the Computer-Aided Prescription Model for Parkinson's Disease
Yinghuan Shi (Nanjing University, P.R. China)

12:25
An Algorithm Strategy for Precise Patient Monitoring
Xiao Hu (University of California at San Francisco, USA)

12:40
AI-driven Cuff-less Blood Pressure Measurement
Fen Miao, Zengding Liu and Bo Wen (Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, P.R. China)

12:55
Normalization of MR images from multi-center and multi-equipment
Jinhua Yu (Fudan University, P.R. China)

Monday, May 20

11:55 - 13:25
BSN Session # 2 - Biodegradable and flexible electronic sensing
Room: Meeting Room F
Chair: Canan Dagdeviren (Massachusetts Institute of Technology, USA), Gaetano Marrocoo (University of Rome Tor Vergata)

11:55
Biodegradable Piezoelectric Sensor
Thanh Nguyen (University of Connecticut, USA)

12:15
Low-cost Foil based Wearable Sensory System for Chest Sound Analysis to Monitor Wheezing
Sherjeel M Khan (King Abdullah University of Science and Technology, Saudi Arabia); Muhammad Hussain (KAUST, Saudi Arabia)

12:35
Adjustable Passive RFID Skin Mounted Tag
Viktorija Makarovaite, Aaron Hillier, John Batchelor, Simon Holder and Campbell Gourlay (University of Kent, United Kingdom (Great Britain))

12:55
Wireless Soft Hybrid Electronics for Safe and Effective Cardiac Monitoring in Pediatric Care
Yun-Soung Kim, Musa Mahmood and Shinjae Kwon (Georgia Institute of Technology, USA); Joon Won Kang (Chungnam National University, Korea); Woon-Hong Yeo (Georgia Tech, USA)

13:25 - 14:40
Lunch & Meeting with Funding Agencies
Room: Main Hall AB

Panelists:
Wendy Nilson (NSF)
Suzana Petanceska (NIH NIA)
Jean Yuan (NIH CSR)
Elebeoba May (NSF MCB)

Moderator: Stephen Wong (Houston Methodist)

14:45 - 15:30
Keynote Session 2
Room: Main Hall AB

Keynote Speaker: Ketan Paranjape (Roche Diagnostics Corporation): "Integrating and Presenting Patient Data for Personalized Cancer Healthcare"

15:35 - 17:05
BHI Session #3: Big Data Analytics & Machine Learning I
Room: Meeting Room DE
Chairs: Edward Delp (Purdue University & School of ECE, USA), Zhiguo Zhou (UT Southwestern Medical Center, USA)

15:35
Center-Extraction-Based Three Dimensional Nuclei Instance Segmentation of Fluorescence Microscopy Images
David J Ho, Shuo Han and Chichen Fu (Purdue University, USA); Paul Salama and Kenneth Dunn (Indiana University, USA); Edward Delp (Purdue University & School of ECE, USA)

15:50
Reliable lymph node metastasis prediction in head & neck cancer through automated multi-objective model
Zhiguo Zhou, Liyuan Chen and David Sher (UT Southwestern Medical Center, USA); Xi Chen (Xi'an Jiaotong University & Institute of Image Processing and Pattern Recognition, P.R. China); Steve Jiang and Jing Wang (UT Southwestern Medical Center, USA)

16:05
Joint Segmentation and Landmark Localization of Fetal Femur in Ultrasound Volumes
Xu Wang (Shenzhen University, P.R. China); Xin Yang (The Chinese University of Hong Kong, Hong Kong); Haoran Dou (Shenzhen University, P.R. China); Shengli Li (Nanfang Medical University, P.R. China); Pheng Ann Heng (The Chinese University of Hong, Hong Kong); Dong Ni (Shenzhen University, P.R. China)

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16:20
Functional connectivity magnetic resonance imaging classification of autism spectrum disorder using the multisite ABIDE dataset
Xin Yang (Southern Arkansas University, USA); Mohammad Samiul Islam (North South University, Bangladesh); A M Arefin Khaled (Southern Arkansas University, USA)

16:35
Prediction of Progression to Alzheimer's disease with Deep InfoMax
Alex Fedorov (The Mind Research Network, University of New Mexico, USA); R Devon Hjelm (Microsoft Research, Mila, University of Montreal, Canada); Anees Abrol (The Mind Research Network, University of New Mexico, USA); Zening Fu (The Mind Research Network, USA); Yuhui Du (The Mind Research Network, Shanxi University, USA); Sergey Plis (The Mind Research Network (MRN), USA); Vince Calhoun (University of New Mexico, USA)

16:50
Longitudinal Prediction Modeling of Alzheimer Disease using Recurrent Neural Networks
Solale Tabarestani, Maryamossadat Aghili, Mehdi Shojaie, Christian Freytes, Mercedes Cabrerizo, Armando Barreto and Naphtali Rishe (Florida International University, USA); Rosie Curiel (University of Miami, USA); David Loewenstein (Mount Sinai Medical Center, USA); Ranjan Duara (Mount Sinai Medical Center, USA); Malek Adjouadi (Florida International University, USA)

15:35 - 17:05
BHI Session #4: Bioinformatics
Room: Meeting Room GH
Chairs: Ramana Davuluri (Northwestern University & Feinberg School of Medicine, USA), Kamal Taha (Khalifa University of Science, Technology & Research, United Arab Emirates)

15:35
Predicting Drug-Target Interactions Using Weisfeiler-Lehman Neural Network
Hafez Eslami Manoochehri (The University of Texas at Dallas, USA); Susmitha Sri Kadiyala and Mehrdad Nourani (University of Texas at Dallas, USA)

15:50
Employing the Inference Rules of Predicate Logic for Predicting Protein Functions
Kamal Taha (Khalifa University of Science, Technology & Research, United Arab Emirates)

16:05
Identifying Appropriate Probabilistic Models for Sparse Discrete Omics Data
Hani Aldirawi (University of Illinois at Chicago(UIC), USA); Jie Yang (University of Illinois at Chicago (UIC), USA); Ahmed A. Metwally (Stanford University, USA)

16:20
Alterations in Chromatin Folding Patterns in Cancer Variant-Enriched Loci
Alan Perez-Rathke, Samira Mali, Lin Du and Jie Liang (University of Illinois at Chicago, USA)

16:35
Taxonomic Classification at the Strain Level using a Species-of-Interest k-mer Database
Mladen Rasic (University of Illinois at Chicago, USA); Ahmed A. Metwally (Stanford University, USA); Patricia Finn and David Perkins (University of Illinois at Chicago, USA)

16:50
Structure-based Method for Predicting Deleterious Missense SNPs
Boshen Wang, Xue Lei, Wei Tian and Alan Perez-Rathke (University of Illinois at Chicago, USA); Jeffrey Tseng (Wayne State University, USA); Jie Liang (University of Illinois at Chicago, USA)

15:35 - 17:05
BSN Session # 3 - RF, Wireless Communication, Security and Privacy
Room: Meeting Room F
Chair: Edward Sazonov (The University of Alabama, USA), Brian Telfer (MIT Lincoln Laboratory, USA)

15:35
A Channel Hopping Strategy Based on the Human Trajectory Similarity for WBANs
Xiaoyu Zhang and Bin Liu (University of Science and Technology of China, P.R. China)

15:55
Upper-bound Performances of RFID Epidermal Sensor Networks at 5G Frequencies
Francesco Amato (University of Roma Tor Vergata, Italy); Sara Amendola (University of Rome Tor Vergata & Radio6ense srl, Italy); Gaetano Marrocco (University of Rome Tor Vergata, Italy)

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16:15
A Wearable Wrist-Band with Compressive Sensing based Ultra-Low Power Photoplethysmography Readout Circuit
Parvez Ahmmed, James Dieffenderfer and Jose Valero-Sarmiento (North Carolina State University, USA); Venkata Rajesh Pamula (University of Washington, USA & Imec, Belgium); Nick Van Helleputte (Imec, Belgium); Chris Van Hoof (IMEC, Belgium); Marian K. h. Verhelst (University of Leuven (KULeuven), Belgium); Alper Bozkurt (North Carolina State University, USA)

16:35
Performance Comparison of Patch and Loop Antennas for the Wireless Power Transfer and Transcutaneous Telemetry in the 860-960 MHz Frequency Band
Carolina Miozzi (University of Rome "Tor Vergata", Italy); Giovanni Saggio (University of Tor Vergata, Rome, Italy); Emanuele Gruppioni (INAIL Centro Protesi, Italy); Gaetano Marrocco (University of Rome Tor Vergata, Italy)

17:05 - 17:40
Coffee Break & Networking with Leaders
Room: Main Hall AB, Main Hall C

17:40 - 19:15
Rapid Fire Session #1
Room: Main Hall AB
Chairs (BHI): David Clifton, (University of Oxford); Georgia Tourassi (Oak Ridge National Laboratory)
Chairs (BSN): Shanshan Chen (Virginia Commonwealth University); Kunal Mankodiya (University of Rhode Island)

19:15 - 20:15
Poster Session #1
Room: Main Hall C

BHI-M-1: Neurophysiological Variations in Food Decision-Making within Virtual and Real Environments
Charissa S. L. Cheah and Stephen P. Kaputsos (University of Maryland, Baltimore County, USA); Varun Mandalapu (University of Maryland Baltimore County, USA); Truc "Claire" Thanh Tran (University of Maryland, Baltimore County & SAIL LAB, USA); Salih Barman, Sarah Jung and Kathy T. T. Vu (University of Maryland, Baltimore County, USA); Travis Masterson (Dartmouth College, USA); Ryan Zuber (University of Maryland Baltimore County & Imaging Research Center, USA); Lee Boot and Jiaqi Gong (University of Maryland Baltimore County, USA)

BHI-M-2: A Generic Algorithm for Sleep-Wake Cycle Detection using Unlabeled Activity Data
Shanshan Chen and Robert Perera (Virginia Commonwealth University, USA); Matthew Engelhard, Jessica Lunsford-Avery and Scott Kollins (Duke University, USA); Bernard Fuemmeler (Virginia Commonwealth University, USA)

BHI-M-3: Leveraging transfer learning techniques for classifying infant vocalizations
Aditya Gujral, Kexin Feng, Gulshan Mandhyan, Nfn Snehil and Theodora Chaspari (Texas A&M University, USA)

BHI-M-4: Centroid of Age Neighborhoods: A Generalized Approach to Estimate Biological Age
Syed Ashiqur Rahman and Donald Adjeroh (West Virginia University, USA)

BHI-M-5: Quantifying eating behavior with a smart plate in patients with arm impairment after stroke
Gert Mertes (University of Oxford, United Kingdom (Great Britain) & KU Leuven, Belgium); Li Ding and Wei Chen (Fudan University, P.R. China); Hans Hallez (KU Leuven, Belgium); Jie Jia (Fudan University, P.R. China); Bart Vanrumste (KU Leuven, Belgium)

BHI-M-6: Semi-Supervised Information Extraction for Cancer Pathology Reports
Hong-Jun Yoon, John Qiu, Georgia Tourassi and Mohammed Alawad (Oak Ridge National Laboratory, USA)

BHI-M-7: Deep Transfer Learning Across Cancer Registries for Information Extraction from Pathology Reports
Mohammed Alawad, Georgia Tourassi and Hong-Jun Yoon (Oak Ridge National Laboratory, USA)

BHI-M-8: Model-based Hyperparameter Optimization of Convolutional Neural Networks for Information Extraction from Cancer Pathology Reports on HPC
Hong-Jun Yoon, Georgia Tourassi and Mohammed Alawad (Oak Ridge National Laboratory, USA)

BHI-M-9: The MOVECARE Project: Home-based Monitoring of Frailty
Francesca Lunardini (Politecnico di Milano, Italy); Matteo Luperto (Università degli Studi di Milano, Italy); Marta Romeo (University of Manchester, United Kingdom (Great Britain)); Jennifer Renoux (Örebro University, Sweden); Nicola Basilico (University of Milan, Italy); Andrej Krpič (Smart Com, Slovenia); Nunzio Alberto Borghese (University of Milan, Italy); Simona Ferrante (Politecnico di Milano, Italy)

BHI-M-10: Predicting Oncogenic Missense Mutations
Xue Lei, Boshen Wang, Alan Perez-Rathke and Wei Tian (University of Illinois at Chicago, USA); Chia-Yi Chou and Jeffrey Tseng (Wayne State University, USA); Jie Liang (University of Illinois at Chicago, USA)

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BHI-M-11: Brain-Inspired Hyperdimensional Computing for Real-Time Health Analysis
Mohsen Imani (UCSD, USA); Tarek Nassar (University of California San Diego, USA); Tajana Simunic Rosing (University of California, San Diego, USA)

BHI-M-12: Topic Discovery for Biomedical Corpus Using MeSH Embeddings
Guangxu Xun and Kishlay Jha (University of Virginia, USA); Ye Yuan (Beijing University of Technology, P.R. China); Aidong Zhang (University of Virginia, USA)

BHI-M-13: Unsupervised Prediction of Negative Health Events Ahead of Time
Anahita Hosseini and Majid Sarrafzadeh (UCLA, USA)

BHI-M-14: HospiT'Win: A Predictive Simulation-Based Digital Twin for Patients Pathways in Hospital
Abdallah Karakra, Franck Fontanili, Elyes Lamine and Jacques Lamothe (University of Toulouse - IMT MINES ALBI, France)

BHI-M-15: Charactering hESCs Organoids from Electrical Signals with Machine Learning
Md Musaddaqul Hasib, Zane Lybrand, Vanesa Estevez, Jenny Hsieh and Yufei Huang (University of Texas at San Antonio, USA)

BHI-M-16: Mining Regional Imaging Genetic Associations via Voxel-wise Enrichment Analysis
Xiaohui Yao (University of Pennsylvania, USA); Shan Cong (Purdue University, USA); Jingwen Yan (Indiana University Indianapolis, USA); Shannon Risacher and Andrew Saykin (Indiana University School of Medicine, USA); Jason Moore and Li Shen (University of Pennsylvania, USA)

BHI-M-17: Modeling Blood Volume Pulse Signal Using Exercise Intensity
Sediqeh Samadi and Mudassir Rashid (Illinois Institute of Technology, USA); Mohammad Reza Askari (400 E. 33rd Street & Illinois Institute of Technology, USA); Shahineze Saada and Paul Kolodziej (Illinois Institute of Technology, USA); Minsun Park and Laurie Quinn (University of Illinois at Chicago, USA); Ali Cinar (Illinois Institute of Technology, USA)

BHI-M-18: Laterality Coefficient: An EEG parameter related with the functional improvement in stroke patients
Marc Sebastian (Universitat Autònoma de Barcelona & GTEC, Spain); Rupert Ortner (GTEC Medical Engineering Spain SL, Spain); Esther Udina (Universitat Autònoma de Barcelona, Spain); Josep Dinarès-Ferran (GTEC, Spain); Katrin Mayr (Guger Technologies OG, Austria); Fan Cao (GTEC, USA); Christoph Guger (Guger Technologies OEG, Austria)

BHI-M-19: Designing an ontology for Head and Neck Cancer research
Liss Hernández González, Laura Lopez-Perez and Ana Ugena (Universidad Politécnica de Madrid, Spain); Maria Fernanda Cabrera-Umpierrez and Maria Teresa Arredondo (Life Supporting Technologies; Technical University of Madrid, Spain); Giuseppe Fico (Universidad Politécnica de Madrid, Spain)

BHI-M-20: BWA-MEM Performance: Suffix Array Storage Size
Meysam Roodi (University of Toronto, Canada); Zahra Lak (Huawei Canada, Canada); Andreas Moshovos (University of Toronto, Canada)

BHI-M-21: circFA: a FPGA-based circular RNA aligner
Alberto Zeni, Francesco Peverelli, Enrico Cabri, Lorenzo Di Tucci and Luca Cerina (Politecnico di Milano, Italy); Marco D Santambrogio (Politecnico di Milano & MIT, Italy)

BHI-M-22: Disruption of gene co-expression network along the progression of Alzheimer's disease
Yurika Upadhyaya (Indiana University Indianapolis, USA); Linhui Xie (Purdue University Indianapolis, USA); Kwangsik Nho (Indiana University School of Medicine, USA); Paul Salama (Indiana University, USA); Andrew Saykin (Indiana University School of Medicine, USA); Jingwen Yan (Indiana University Indianapolis, USA)

BHI-M-23: Computational Astrocyence: Astrocytes encode inhibitory activity into the frequency and spatial extent of their calcium elevations
Ioannis Polykretis (Rutgers University, USA); Vladimir A Ivanov (Rutgers, The State University of New Jersey, USA); Konstantinos Michmizos (Rutgers University, USA)

BHI-M-24: Axonal Conduction Velocity Impacts Neuronal Network Oscillations
Vladimir A Ivanov (Rutgers, The State University of New Jersey, USA); Ioannis Polykretis and Konstantinos Michmizos (Rutgers University, USA)

BHI-M-25: Efficient Skin Spectrum Coding Method
Soyoung Lee, Karam Choi and Sung Hyun Nam (Samsung Advanced Institute of Technology, Samsung Electronics, South Korea)

BHI-M-26: Open Framework for Mammography-based Breast Cancer Risk Assessment
Said Pertuz (Universidad Industrial de Santander, Colombia); Rulla Tamimi (Brigham and Women's Hospital, USA); Joni Kämäräinen and German Torres (Tampere University of Technology, Finland)

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BHI-M-27: Unsupervised Seizure Detection based on Rhythmical Activity and Spike Detection in EEG Signals
Kostas M. Tsiouris (National Technical University of Athens, Greece); Spiros Konitsiotis (University of Ioannina, Greece); Dimitrios Koutsouris (National Technical University of Athens, Greece); Dimitris Fotiadis (Institute of Molecular Biology and Biotechnology, FORTH, Greece)

BHI-M-28: Filter Bank Spatiotemporal Beamforming for Frequency Detection in SSVEP-based BCI
Yichuan Jiang (School of Biological Science and Medical Engineering, Southeast University, P.R. China); Yue Kang, Peng Wang and Sheng Ge (Southeast University, P.R. China)

BHI-M-29: Physiology-sensitive Virtual Reality based Strength Training Platform for Post-stroke Grip Task
Adyasha Dash (Indian Institute of Technology Gandhinagar, India); Anand Yadav (E-345, IIT Gandhinagar & IIT Gandhinagar, India); Uttama Lahiri (Indian Institute of Technology Gandhinagar, India)

BHI-M-30: A Novel EOG based Synchronous and Asynchronous Visual Keyboard System
Saravanakumar D and Vishnupriya R (Indian Institute of Technology Madras, India); RamasubbaReddy Machireddy (IITM, India)

BHI-M-31: Unsupervised harmonic frequency-based gait sequence detection for Parkinson's disease
Martin Ullrich (Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU), Germany); Julius Hannink (Friedrich Alexander University Erlangen Nuremberg, Germany); Heiko Gaßner and Jochen Klucken (University Hospital, Erlangen, Germany); Bjoern M Eskofier (Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany); Felix Kluge (Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU), Germany)

BHI-M-32: Automated Identification of Persistent Time-Domain Features in Seismocardiogram Signals
Jonathan Zia and Jacob Kimball (Georgia Institute of Technology, USA); Mobashir Shandhi (Georgia Tech, USA); Omer T Inan (Georgia Institute of Technology, USA)

BHI-M-33: Reconstructing 3D Lung Shape from a Single 2D Image during the Deaeration Deformation Process using Model-based Data Augmentation
Shuqiong Wu and Megumi Nakao (Graduate School of Informatics, Kyoto University, Japan); Junko Tokuno and Toyofumi Chen-Yoshikawa (Kyoto University Hospital, Japan); Tetsuya Matsuda (Graduate School of Informatics, Kyoto University, Japan)

BHI-M-34: Rapid Detection of Inactive Channels during Multi-unit Intracranial Recordings
Brian Premchand (Agency for Science, Technology and Research, Singapore); Kyaw Toe (Institute for Infocomm Research, A*STAR, Singapore); Chuanchu Wang (Institute for Infocomm Research (I2R) A*Star, Singapore); Camilo Libedinsky (National University of Singapore (NUS), Singapore); Kai Keng Ang (Institute for Inforcomm Research, A*STAR, Singapore); Rosa Q So (Institute for Infocomm Research, Singapore)

BHI-M-35: Respiratory Rate Estimation from Face Videos
Mingliang Chen and Qiang Zhu (University of Maryland, USA); Harrison Zhang (Georgia Institute of Technology, USA); Min Wu (University of Maryland, College Park, USA); Quanzeng Wang (Food and Drug Administration, USA)

BHI-M-36: Improved Decoding of EEG-Based Motor Imagery Using Convolutional Neural Network and Data Space Adaptation
Shawn Chua (National University of Singapore, Singapore); Rosa Q So and Tao Yang (Institute for Infocomm Research, Singapore)

BHI-M-37: CCi-MOBILE: Design and Evaluation of a Cochlear Implant and Hearing Aid Research Platform for Speech Scientists and Engineers
John Hansen (University of Texas at Dallas, USA); Hussnain Ali, Juliana Saba, RamCharan ChandraShekar, Nursadul Mamun, Ria Ghosh and Avamarie Brueggeman (CRSS Center for Robust Speech Systems CILab UTDallas, USA)

BHI-M-38: Relationship Between Fetal Behavioral State and Auditory and Visual Stimulation
Neslihan Bisgin and James Wilson (University of Arkansas at Little Rock, USA); Murphy Pamela, Eric Siegel, Curtis Lowery and Hari Eswaran (University of Arkansas for Medical Sciences, USA)

BHI-M-39: Mental Workload Classification via Hierarchical Latent Dictionary Learning: A Functional Near Infrared Spectroscopy Study
Srinidhi Parshi, Md. Rafiul Amin, Hamid Fekri Azgomi and Rose T. Faghih (University of Houston, USA)

BHI-M-40: Phasic Component of Electrodermal Activity is more Correlated to Brain Activity than Tonic Component
Hugo Posada-Quintero and Ki Chon (University of Connecticut, USA)

BHI-M-41: ResHNet: Spectrograms Based Efficient Heart Sounds Classification Using Stacked Residual Networks
Akshaya Balamurugan (Institute of Systems Science, National University of Singapore, Singapore); Sin Teo (Institute for Infocomm Research, Singapore); Jianxi Yang (Chongqing Jiaotong University, P.R. China); Xulei Yang (Yitu, Singapore); Zeng Zeng (A*STAR, Singapore)

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BHI-M-42: Validation of bcbio-nextgen Pipeline Based on NextSeq500 Exome Sequencing
Erinija Pranckeviciene (Regional Genetics, CHEO, Canada & Faculty of Medicine, Vilnius University, Lithuania); Ryan J Potter (Children's Hospital of Eastern Ontario, Canada); Olga Jarinova (University of Ottawa & Regional Genetics, CHEO, Canada); Lijia Huang (Regional Genetics, CHEO, Canada)

BHI-M-43: Validity of digital Trail Making Test and Bells Test in elderlies
Francesca Lunardini (Politecnico di Milano, Italy); Matteo Luperto (Università degli Studi di Milano, Italy); Katia Daniele (Fondazione IRCCS Cà Granda – Ospedale Maggiore Policlinico, Italy); Nicola Basilico (University of Milan, Italy); Sarah Damanti and Carlo Abbate (Fondazione IRCCS Ca' Granda Ospedale Maggiore Policlinico, Italy); Daniela Mari (Fondazione IRCCS Cà Granda – Ospedale Maggiore Policlinico, Italy); Matteo Cesari (Fondazione IRCCS Ca' Granda Ospedale Maggiore Policlinico, Italy); Simona Ferrante (Politecnico di Milano, Italy); Nunzio Alberto Borghese (University of Milan, Italy)

BHI-M-44: Multimodal Ensemble Approach to Incorporate Various Types of Clinical Notes for Predicting Readmission
Bonggun Shin, Julien Hogan, Andrew B. Adams, Raymond J. Lynch, Rachel E. Patzer and Jinho D. Choi (Emory University, USA)

BHI-M-45: Impact of Personalization on Epileptic Seizure Prediction
Javad Birjandtalab, Vipul Nataraj Jarmale and Mehrdad Nourani (University of Texas at Dallas, USA); Jay Harvey (UT Southwestern Medical Center, USA)

BHI-M-46: Deep Learning for Visual Recognition of Environmental Enteropathy and Celiac Disease
Aman Shrivastava, Karan Kant, Saurav Sengupta, Sung Jun Kang, Marium Khan and Sean Moore (University of Virginia, USA); S. Asad Ali (Aga Khan University, Pakistan); Beatrice Amadi (University of Zambia, Zambia); Paul Kelly (Queen Mary University of London, United Kingdom (Great Britain)); Sana Syed and Donald Brown (University of Virginia, USA)

BHI-M-47: When vestibular rehabilitation can assist: findings with use of data mining
Dimitrios Gatsios and Kostas M. Tsiouris (University of Ioannina, Greece); Dimitrios Kikidis, Athanasios Bibas and Christos Nikitas (National Kapodistrian University of Athens, Greece); Doris Eva Bamiou and Linda Luxon (University College London, United Kingdom (Great Britain)); Christoph Maurer (Neurologische Universitätsklinik, Germany); Floris Wuyts and Laura Celis (University of Antwerp, Belgium); Leen Maes (Ghent University, Belgium); Themis Exarchos (Ionian University & University of Ioannina, Greece); Dimitris Fotiadis (Institute of Molecular Biology and Biotechnology, FORTH, Greece)

BHI-M-48: A new method for breast micro-calcification detection and characterization using digital temporal subtraction of mammogram pairs
Kosmia Loizidou (University of Cyprus & KIOS Research and Innovation Center of Excellence, Cyprus); Galateia Skouroumouni (Nicosia General Hospital, Cyprus); Christos Nikolaou (Limassol General Hospital & Radiology Department, Cyprus); Costas Pitris (University of Cyprus & KIOS Research and Innovation Center of Excellence, Cyprus)

BHI-M-49: Simultaneous Multi-Surface Fitting for Vessel Wall Layer Delineation
Max L Olender and Lambros Athanasiou (Massachusetts Institute of Technology, USA); Jose de la Torre Hernandez (Hospital Universitario Marques de Valdecilla, Spain); Eyal Ben-Assa and Elazer Edelman (Massachusetts Institute of Technology, USA)

BHI-M-50: Improved Prediction on Heart Transplant Rejection Using Convolutional Autoencoder and Multiple Instance Learning on Whole-Slide Imaging
Yuanda Zhu and Li Tong (Georgia Institute of Technology, USA); Shriprasad Deshpande (Children's National Health System, USA); May Dongmei Wang (Georgia Tech and Emory Univ, USA)

BHI-M-51: Compressed Sensing MRI Reconstruction using Low Dimensional Manifold Model
Saim Abdullah and Omar Arif (National University of Sciences and Technology, Pakistan); Tahir Mehmud (Benazir Bhutton Shaheed Teaching Hospital, Pakistan); Muhammad Bilal Arif (CMH Panu Aqil, Pakistan)

BHI-M-52: Medical Image Segmentation with Stochastic Aggregated Loss in a Unified U-Net
Phi Xuan Nguyen (Nanyang Technological University, Singapore); Zhongkang Lu, Weimin Huang and Su Huang (Institute for Infocomm Research, Singapore); Akie Katsuki (GE Healthcare Japan Corporation, Japan); Zhiping Lin (NTU, Singapore)

BHI-M-53: 3D Inception U-Net for Aorta Segmentation using Computed Tomography Cardiac Angiography
Savitha Rani Ravichandran and Balaji Nataraj (National University of Singapore, Singapore); Su Huang (Institute for Infocomm Research, Singapore); Zhiliang Qin (Data Storage Institute, Singapore); Zhongkang Lu (Institute for Infocomm Research, Singapore); Akie Katsuki (GE Healthcare Japan Corporation, Japan); Weimin Huang (Institute for Infocomm Research, Singapore); Zeng Zeng (A*STAR, Singapore)

BHI-M-54: Image Identification of Animal Tumor Models for Human Breast Cancer Research
William ONeill (University of Illinois at Chicago, USA); Steven Penny, Jr (University of Illinois-Chicago, USA)

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BHI-M-55: Towards an Automatic Imaging Biopsy of Non-Small Cell Lung Cancer
Eleonora D'Arnese, Guido Walter Di Donato and Emanuele Del Sozzo (Politecnico di Milano, Italy); Marco D Santambrogio (Politecnico di Milano & MIT, Italy)

BHI-M-56: An image informatics pipeline for imaging mass cytometry to characterize the immune landscape in pre- and on-treatment immune therapy and its application in recurrent platinum-resistant epithelial ovarian cancer
Ying Zhu (Houston Methodist Research Institute, USA); Tsz-Lun Yeung (The University of Texas MD Anderson Cancer Center, USA); Jianting Sheng (Houston Methodist Cancer Center, USA); Emily Hinchcliff, Jared Burks, Amir Jazaeri and Samuel Mok (The University of Texas MD Anderson Cancer Center, USA); Stephen Wong (Houston Methodist Cancer Center, USA)

BHI-M-57: X-Ray Image Compression Using Convolutional Recurrent Neural Networks
Asif Shahriyar and Shakib Uz Zaman (Bangladesh University of Engineering and Technology, Bangladesh); Ahmed Imtiaz Humayun (Bangladesh University of Engineering and Technology & mHealth Research Group, Bangladesh); Taufiq Hasan and Mohammed Imamul Hassan Bhuiyan (Bangladesh University of Engineering and Technology, Bangladesh)

BHI-M-58: Applying translational medicine by Using the WELCOME Remote Monitoring System on Patients with COPD and Comorbidities
Nicos Maglaveras (Aristotle University of Thessaloniki, Greece)

BHI-M-59: A Knowledge Graph Approach for the Secondary Use of Cancer Registry Data
Georgia Tourassi (Oak Ridge National Laboratory, USA); S M Shamimul Hasan and C. Christian (Oak Ridge National Lab, USA); Donna Rivera (National Institutes ff Health, USA); Xiao-Cheng Wu (Louisiana Tumor Registry, USA)

BHI-M-60: Feature Exploration and Causal Inference on Mortality of Epilepsy Patients Using Insurance Claims Data
Yuanda Zhu and Hang Wu (Georgia Institute of Technology, USA); May Dongmei Wang (Georgia Tech and Emory Univ, USA)

BHI-M-61: Non-Invasive Inference of Minute Ventilation Using Wearable ECG and Gaussian Process Regression
Ridwan Alam (University of Virginia, USA); David Peden (University of North Carolina, USA); Jiaqi Gong (University of Maryland Baltimore County, USA); John Lach (University of Virginia, USA)

BHI-M-62: A Deep Learning Approach for Sleep-Wake Detection from HRV and Accelerometer Data
Zhenghua Chen (Institute for Infocomm Research, A*STAR, Singapore); Min Wu (Institute for Infocomm Research, Singapore); Jiyan Wu and Jie Ding (Institute for Infocomm Research, A*STAR, Singapore); Zeng Zeng (A*STAR, Singapore); Karl Surmacz (Mclaren Applied Technologies, Singapore); Xiaoli Li (Institute for Infocomm Research, Singapore)

BHI-M-63: Immersive Augmented Reality (I Am Real) - Remote Clinical Consultation
Qing Zhang and Mohanraj Karunanithi (CSIRO ICT Centre, Australia); Chansuk Kang (CSIRO, Australia)

BHI-M-64: Change Point Detection in Knee Acoustic Emissions using the Teager Operator: A Preliminary Study in Patients with Juvenile Idiopathic Arthritis
Beren Semiz and Sinan Hersek (Georgia Institute of Technology, USA); Daniel C Whittingslow (Emory University School of Medicine and Georgia Institute of Technology, USA); Lori Ponder and Sampath Prahalad (Emory University School of Medicine, USA); Omer T Inan (Georgia Institute of Technology, USA)

BHI-M-65: An Architecture for Metadata-driven Integration of Heterogeneous Sensor and Health Data for Translational Exposomic Research
Ramkiran Gouripeddi, Le-Thuy Tran, Randy Madsen, Tanvi Gangadhar, Peter Mo, Nicole Burnett, Ryan Butcher, Katherine Sward and Julio Facelli (University of Utah, USA)

BHI-M-66: Detection of C-Reactive Protein using network - deployable DNA aptamer based optical nanosensor
Shreya Ghosh, Anna Metlushko, Shreya Chaudhry, Mitra Dutta and Michael Stroscio (University of Illinois at Chicago, USA)

BHI-M-67: A 0.5 nW Analog ECG Processor for Real Time R-wave Detection Based on Pan-Tompkins Algorithm
Cihan B. Güngör (University of California San Diego & San Diego State University, USA); Hakan Töreyin (San Diego State University, USA)

BHI-M-68: Concept for a Permanent, Non-Invasive Blood Pressure Measurement in the Ear
Jennifer Zeilfelder and Matthias Diehl (FZI Forschungszentrum Informatik, Germany); Christian Pylatiuk (Karlsruhe Institute of Technology (KIT), Germany); Wilhelm Stork (Karlsruhe Institute of Technology, Germany)

BHI-M-69: Estimating Berg Balance Scale and Mini Balance Evaluation System Test Scores by Using Wearable Shoe Sensors
Wenlong Tang (Novartis, USA); George Fulk and Stacey Zeigler (Clarkson University, USA); Ting Zhang (University of Houston Downtown, USA); Edward Sazonov (The University of Alabama, USA)

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BHI-M-70: Lung Nodule Classification Using Combined Deep and Spectral 3D Shape Features
Fereshteh S Bashiri (Marshfield Clinic Research Institute & University of Wisconsin-Milwaukee, USA); Jonathan C Badger (Marshfield Clinic Research Institute, USA); Roshan M D'Souza and Zeyun Yu (University of Wisconsin-Milwaukee, USA); Peggy Peissig (Marshfield Clinic Research Institute, USA)

BHI-M-71: Integrating population data in a computerized Decision Support System for Head and Neck Cancer
Laura Lopez-Perez, Liss Hernández González and Laura Pfaff (Universidad Politécnica de Madrid, Spain); Annalisa Trama and Gemma Gatta (Fondazione IRCCS - INT, Italy); Silvia Francisci and Sandra Mallone (Instituto Superiore di Sanità, Italy); Elena Martinelli (Azienda Ospedaliero-universitaria di Parma, Italy); Ana Ugena (Universidad Politécnica de Madrid, Spain); Stefano Cavalieri (Fondazione IRCCS - INT, Italy); Lisa Licitra (Fondazione IRCCS - INT & University of Milan, Italy); Maria Fernanda Cabrera-Umpierrez and Maria Teresa Arredondo (Life Supporting Technologies; Technical University of Madrid, Spain); Sergio Guillén (Ronda Auguste y Louis Lumiere, Spain); Giuseppe Fico (Universidad Politécnica de Madrid, Spain)

BSN-M-1: Weft Knit Smart Data Glove
Emmanuel Ayodele, Syed Ali Raza Zaidi, Zhi-Qiang Zhang, Qingxiang Kong and Jane Scott (University of Leeds, United Kingdom (Great Britain)); Desmond McLernon (The University of Leeds, United Kingdom (Great Britain))

BSN-M-2: The validity of a mixed reality-based functional mobility assessment
Ruopeng Sun (University of Illinois at Urbana-Champaign & Stanford University, USA); Roberto Aldunate and Jacob Sosnoff (University of Illinois at Urbana-Champaign, USA)

BSN-M-3: Python-Integrated Wearable Research Platform for Fast Software Prototyping in Gait Retraining Applications
Junkai Xu, Fangyuan Cao, David P. Chiasson and Peter Shull (Shanghai Jiao Tong University, P.R. China)

BSN-M-4: A Low-Cost Wearable System to Estimate Free-Living 3D Ground Reaction Force
Nicholas A Williams, Ethan Steiner, Tezin Nanglo, Mahmood Jasim and Jaehyun Kim (University of Massachusetts - Amherst, USA); Jean-Francois Daneault (Rutgers University, USA); Katherine Boyer (University of Massachusetts - Amherst, USA); Sunghoon Ivan Lee (University of Massachusetts, USA)

BSN-M-5: Reliability and Validity of the Equivital EQ 02 Physiological Monitoring System
Heather M Hansen (US Army Research Institute of Environmental Medicine, USA); William J. Tharion (United States Army Research Institute of Environmental Medicine, USA); David Looney (USARIEM, USA); Leila A. Walker (United States Army Research Institute of Environmental Medicine, USA); Christopher R Chalmers (US Army Research Institute of Environmental Medicine, USA); Alexander P Welles (United States Army Research Institute of Environmental Medicine, USA); Holly L McClung (US Army Research Institute of Environmental Medicine, USA)

BSN-M-6: Radial Pulse Detection Using SWR Bridge and RF Spiral Resonator
Noor Mohammed, Kim Cluff, Mark A Sutton, Ben Loflin, Jacob L Griffith, Ryan A Becker, Subash Bhandari and Bernardo Villafana Ibarra (Wichita State University, USA)

BSN-M-7: Colorimetric Determination of Cortisol in Human Biofluid
Ahyeon Koh (SUNY Binghamton University, USA); Ethan Tu (State University of New York, Binghamton, USA)

BSN-M-8: Egocentric vision and wearable sensors for capture and modification of eating behavior in the wild
Edward Sazonov (The University of Alabama, USA)

BSN-M-9: Skin-inspired, Micromesh Elastomer for Breathable, Conformal Biosensor Integration
Ahyeon Koh and Matthew Brown (SUNY Binghamton University, USA)

BSN-M-10: Collagen/PDMS based composite for increased bio-fluid retention in wearable microfluidic devices
Ahyeon Koh and Benjamin Heo (SUNY Binghamton University, USA)

BSN-M-11: A Non-invasive Wearable Readout System for Bio-fluid Phenomena Detection
Noor Mohammed, Kim Cluff, Jacob L Griffith and Ben Loflin (Wichita State University, USA)

BSN-M-12: Assessing Individual Dietary Intake in Food Sharing Scenarios with a 360 Camera and Deep Learning
Jianing Qiu (Imperial College London, United Kingdom (Great Britain)); Po Wen Lo (Imperial College London & ICL, United Kingdom (Great Britain)); Benny Lo (Imperial College, United Kingdom (Great Britain))

BSN-M-13: Arterial Pulse Measurement with Wearable Millimeter Wave Device
Jessi Johnson (Blumio Inc., USA); Oliver Shay and Chris Kim (Blumio, Inc., USA)

BSN-M-14: Roll-to-Roll processable OTFT-based Amplifiers and Application for pH sensing
Kai Zhang and Chine-Mei Chen (University of Oxford, United Kingdom (Great Britain)); Salzitsa Anastasova (Imperial College, London, United Kingdom (Great Britain)); Bruno Miguel Gil Rosa (Hamlyn Centre & Imperial College London, United Kingdom (Great Britain)); Benny Lo (Imperial College, United Kingdom (Great Britain)); Hazel Assender (University of Oxford, United Kingdom (Great Britain))

Monday, May 20

BSN-M-15: Correlating an Ambulatory Voice Measure to Electrodermal Activity in Patients with Vocal Hyperfunction
Gregory Ciccarelli (Massachusetts Institute of Technology Lincoln Laboratory, USA); Daryush Mehta, Andrew Ortiz, Jarrad Van Stan, Laura Toles, Katherine Marks and Robert Hillman (Massachusetts General Hospital, USA); Thomas Quatieri (MIT, USA)

BSN-M-16: Assessment of Chronic Pulmonary Disease Patients Using Biomarkers from Natural Speech Recorded by Mobile Devices
Viswam Nathan, Korosh Vatanparvar, Md Mahbubur Rahman, Ebrahim Nemati and Jilong Kuang (Samsung Research America, USA)

BSN-M-17: Discriminative Information Added by Wearable Sensors for Early-Screening -- a Case Study on Diabetic Peripheral Neuropathy
Shanshan Chen (Virginia Commonwealth University, USA); You Lu and Ningjian Wang (Shanghai Jiaotong University, P.R. China); Le Kang (Virginia Commonwealth University, USA); Benny Lo (Imperial College, United Kingdom (Great Britain)); Yingli Lu (Shanghai Jiaotong University, P.R. China); Guang-Zhong Yang (Imperial College London, United Kingdom (Great Britain))

BSN-M-18: A Generative Model for Speech Segmentation and Obfuscation for Remote Health Monitoring
Korosh Vatanparvar and Viswam Nathan (Samsung Research America, USA); Ebrahim Nemati (UCLA, USA); Md Mahbubur Rahman and Jilong Kuang (Samsung Research America, USA)

BSN-M-19: A Deep Learning Approach on Gender and Age Recognition using a Single Inertial Sensor
Yingnan Sun (Imperial College London, United Kingdom (Great Britain)); Po Wen Lo (Imperial College London & ICL, United Kingdom (Great Britain)); Benny Lo (Imperial College, United Kingdom (Great Britain))

20:15 - 21:45
Welcome Reception
Room: Main Hall AB

Tuesday, May 21

8:00 - 8:45
Keynote Session 3
Room: Main Hall AB

Keynote Speaker:
Arun Jayaraman (Northwestern University): "Wearable Sensors, Smart Phones, and Machine Learning: Impact on Clinical Care and Clinical Trials"

8:50 - 10:20
BHI Session #5: Big Data Analytics & Machine Learning II
Room: Meeting Room AB
Chairs: Ertan Balaban (The University of Manchester, United Kingdom (Great Britain)), Chien-Liang Liu (National Chiao Tung University, Taiwan)

8:50
Utilizing Consumer-grade Wearable Sensors for Unobtrusive Rehabilitation Outcome Prediction
Gina Sprint (Gonzaga University, USA); Diane J. Cook (Washington State University, USA); Douglas Weeks (St. Luke's Rehabilitation Institute, USA); Jason Conci (Gonzaga University, USA)

9:05
Implementation of a batch normalized deep LSTM recurrent network on a smartphone for human activity recognition
Ertan Balaban and Alexander J Casson (The University of Manchester, United Kingdom (Great Britain))

9:20
Serverless Data Parallelization for Training and Retraining of Deep Learning Architecture in Patient-Specific Arrhythmia Detection
Amit Juneja and Michael Marefat (University of Arizona, USA)

9:35
Large-scale Classification of 12-lead ECG with Deep Learning
Yu-Jhen Chen, Chien-Liang Liu and Vincent S. Tseng (National Chiao Tung University, Taiwan); Yu-Feng Hu and Shih-Ann Chen (Taipei Veterans General Hospital, Taiwan)

9:50
Integrating word embedding neural networks with PubMed abstracts to extract keyword proximity of chronic diseases
Ahmad P. Tafti, Yanshan Wang, Feichen Shen, Elham Sagheb, Paul Kingsbury and Hongfang Liu (Mayo Clinic, USA)

10:05
Graph Kernel Prediction of Drug Prescription
Hao-Ren Yao, Der-Chen Chang and Ophir Frieder (Georgetown University, USA); Wendy Huang (Meng Cheng Family Medicine Clinic, Taiwan); Tian-Shyug Lee (Fu Jen Catholic University, Taiwan)

8:50 - 10:20
BHI Special Session #3: Genome Security & Privacy
Room: Meeting Room GH
Chair: Gamze Gursoy (Yale University, USA)

8:50
Blockchain-based Privacy-preserving Predictive Modeling on Genomic/Healthcare Data
Tsung-Ting Kuo (University of California San Diego, USA); Lucila Ohno-Machado (University of California San Diego, La Jolla, California, USA; VA San Diego Healthcare System, La Jolla, California, USA)

9:05
The prediction of human physical appearance from DNA: current & newly emerging traits
Susan Walsh (IUPUI, USA)

9:20
Homomorphic Encryption for Protecting Genome Privacy
Miran Kim (United States & University of Texas, Health Science Center at Houston, USA)

9:35
Inverse Regression for Extraction of Tumor Site From Cancer Pathology Reports
Abhishek K Dubey (Oak Ridge National Lab, USA); Hong-Jun Yoon and Georgia Tourassi (Oak Ridge National Laboratory, USA)

9:50
Quantification of sensitive information leakage from functional genomics data
Mark Gerstein (Yale University, USA)

Tuesday, May 21

8:50 - 10:20
BSN Special Session # 1 - Automated Dietary Monitoring
Room: Meeting Room F
Chair: Oliver Amft (Friedrich-Alexander Universität (FAU) Erlangen-Nürnberg, Germany)

8:50
A Novel Vision-based Approach for Dietary Assessment using Deep Learning View Synthesis
Po Wen Lo (Imperial College London & ICL, United Kingdom (Great Britain)); Jianing Qiu and Yingnan Sun (Imperial College London, United Kingdom (Great Britain)); Benny Lo (Imperial College, United Kingdom (Great Britain))

9:10
Towards a Fully Automatic Food Intake Recognition System Using Acoustic, Image Capturing and Glucose Measurements
Benny Lo (Imperial College, United Kingdom (Great Britain)); Guang-Zhong Yang (Imperial College London, United Kingdom (Great Britain)); Bruno Miguel Gil Rosa (Hamlyn Centre & Imperial College London, United Kingdom (Great Britain)); Salzitsa Anastasova (Imperial College, London, United Kingdom (Great Britain))

9:30
A Comparison of Finger and Wrist Motion Tracking to Detect Bites during Food Consumption
Basil Lin and Adam Hoover (Clemson University, USA)

10:20 - 10:40
Coffee Break
Room: Main Hall C

10:40 - 11:25
Keynote Session 4
Room: Main Hall AB

Keynote Speaker: James L. Madara (American Medical Association): "The Future of Healthcare and Implications for Digital Health"

11:25 - 12:40
Lunch & Clinical/Translational panel
Room: Main Hall AB

Panelists:
James Madara (American Medical Association)
Robert Barish (University of Illinois at Chicago)
Karl Kochendorfer (University of Illinois Hospital & Health Sciences System)
Justin Starren (Northwestern University)

Moderator: Jie Liang (University of Illinois at Chicago)

12:40 - 14:10
BHI Session #6: Imaging Informatics I
Room: Meeting Room DE
Chairs: Jonas E Malmsten (Weill Cornell Medicine & Pace University, USA), Diego Sona (Istituto Italiano di Tecnologia, Italy)

12:40
Automated cell stage predictions in early mouse and human embryos using convolutional neural networks
Jonas E Malmsten (Weill Cornell Medicine & Pace University, USA); Nikica Zaninovic, Qiansheng Zhan and Zev Rosenwaks (Weill Cornell Medicine, USA); Juan Shan (Pace University, USA)

12:55
Augmenting Frame-based with Window-based Features for C. elegans Movement Classification
Jennifer R Piane and Yiyang Wang (DePaul University, USA); Timothy Cheung and Hongkyun Kim (Rosalind Franklin University, USA); Jacob Furst and Daniela Raicu (DePaul University, USA)

13:10
GLCM-CNN: Gray Level Co-occurrence Matrix based CNN Model for Polyp Diagnosis
Jiaxing Tan (City University of New York, the Graduate Center, USA); Weiguo Cao, Yongfeng Gao and Marc Pomeroy (The State University of New York at Stony Brook, USA); Shu Zhang (Research Postdoc, USA); Zhengrong Liang (The State University of New York at Stony Brook, USA); Yumei Huo and Lihong Li (CUNY College of Staten Island, USA)

Tuesday, May 21

13:25
Investigating the Impact of Genetic Background on Brain Dynamic Functional Connectivity Through Machine Learning: A Twins Study
Muhammad Aabubakar Yamin (University of Genova & Istituto Italiano di Tecnologia, Italy); Michael Dayan (Istituto Italiano di Tecnologia, Genova, Italy); Letizia Squarcina (Scientific Institute IRCCS "E. Medea", Bosisio Parini, Italy); Paolo Brambilla (Fondazione IRCCS Ca' Granda Ospedale Maggiore Policlinico, Italy); Vittorio Murino (University of Verona, Italy); Vaibhav Diwadkar (Wayne State University, USA); Diego Sona (Istituto Italiano di Tecnologia, Italy)

13:40
Prioritization of Cognitive Assessments in Alzheimer's Disease via Learning to Rank using Brain Morphometric Data
Bo Peng (Indiana University, USA); Xiaohui Yao (University of Pennsylvania, USA); Shannon Risacher and Andrew Saykin (Indiana University School of Medicine, USA); Li Shen (University of Pennsylvania, USA); Xia Ning (The Ohio State University, USA)

13:55
Semi-Supervised Self-Taught Deep Learning for Finger Bones Segmentation
Zhao Ziyuan and Zhang Xiaoman (National University of Singapore, Singapore); Cen Chen (Hunan University, P.R. China); Li Wei (Huazhong University of Science & Technology, P.R. China); Peng Songyou and Jie Wang (I2R, Singapore); Xulei Yang (Yitu, Singapore); Le Zhang (I2R, Singapore); Zeng Zeng (A*STAR, Singapore)

12:40 - 14:10
BHI Special Session #4: Wearable Sensor Informatics for Cardiopulmonary Monitoring
Room: Meeting Room GH
Chairs: Jin-Oh Hahn (University of Maryland, USA), Omer T Inan (Georgia Institute of Technology, USA)

12:40
Blood Pressure Tracking with Wearable Wrist Ballistocardiography
Peyman Yousefian and Sungtae Shin (University of Mayland, USA); Azin Mousavi (Amirkabir University of Technology, Iran); Chang-Sei Kim (Chonnam National University & School of Mechanical Engineering, Korea); Barry Finegan (University of Alberta, Canada); M Sean McMurtry (University of Alberta, USA); Rama Mukkamala (Michigan State University, USA); Dae-Geun Jang (Korea Advanced Institute of Science and Technology, Korea); Byung-hoon Ko (Samsung Advanced Institute of Technology, Korea); Jongwook Lee (SAIT, Korea); Uikun Kwon (Samsung Electronics, Korea); Youn Ho Kim (SAIT, Korea); Jin-Oh Hahn (University of Maryland, USA)

12:55
Toward Remote Congestive Heart Failure Management using Calf Bioimpedance Measurements
Maggie Delano and Ke Wang (Swarthmore College, USA); Charles Sodini (Massachusetts Institute of Technology, USA)

13:10
A Mixed-Filter Algorithm for Arousal Tracking from Galvanic Skin Response and Heart Rate Measurements
Dilranjan Wickramasuriya and Rose T. Faghih (University of Houston, USA)

13:25
Smartphone Blood Pressure Monitoring
Anand Chandrasekhar and Keerthana Natarajan (Michigan State University, USA); Chang-Sei Kim (Chonnam National University, Korea); Mohammad Yavarimanesh and Mohhammed Naji (Michigan State University, USA); Jin-Oh Hahn (University of Maryland, USA); Rama Mukkamala (Michigan State University, USA)

13:40
Wearable Seismocardiography for Human Health and Performance
Mobashir Shandhi (Georgia Tech, USA); Mozziyar Etemadi and J. Alex Heller (Northwestern University, USA); Liviu Klein and Joanna Fan (University of California, San Francisco, USA); Sinan Hersek and Omer T Inan (Georgia Institute of Technology, USA)

13:55
Robust Heart Rate Variability and Interbeat Interval Detection Algorithm in the Presence of Motion Artifacts
Ayca Aygun and Roozbeh Jafari (Texas A&M University, USA)

12:40 - 14:10
BSN Session # 4 - Medical and wellness applications from pre-natal health to elderly care
Room: Meeting Room F
Chair: Paolo Bonato (Harvard Medical School, USA), John Lach (University of Virginia, USA)

12:40
mLung: Privacy-Preserving Naturally Windowed Lung Activity Detection for Pulmonary Patients
Mohsin Y Ahmed (University of Virginia, USA); Md Mahbubur Rahman, Viswam Nathan, Ebrahim Nemati, Korosh Vatanparvar and Jilong Kuang (Samsung Research America, USA)

Tuesday, May 21

13:00
Developing Computational Models for Personalized ACL Injury Classification
Varun Mandalapu (University of Maryland Baltimore County, USA); Joseph Hart and Stephan G Bodkin (University of Virginia, USA); Nutta Homdee (University of Virginia & Link Lab, USA); John Lach (University of Virginia, USA); Jiaqi Gong (University of Maryland Baltimore County, USA)

13:20
AttentivU: a Wearable Pair of EEG and EOG Glasses for Real-Time Physiological Processing
Nataliya Kosmyna, Caitlin Morris and Utkarsh Sarawgi (MIT Media Lab, USA); Pattie Maes (MIT Media Laboratory, USA); Thanh Nguyen (MIT Media Lab, USA)

13:40
Adaptive Riemannian BCI for Enhanced Motor Imagery Training Protocols
Daniel Freer, Fani Deligianni and Guang-Zhong Yang (Imperial College London, United Kingdom (Great Britain))

14:10 - 14:25
Coffee Break
Room: Main Hall C

14:25 - 15:55
Keynote Session 5
Room: Main Hall AB

Keynote Speakers:
Susan Tousi (Vice President of Product Development at Illumina, Inc.): "Advancing Genomics through Integrated Informatics"
David Duffy (Quanterix Corporation): "The Use of Single Molecule Detection Technologies to Define Molecularly the Continuum from Health to Disease"

16:00 - 18:10
Rapid Fire Session #2
Room: Main Hall AB
Chairs (BHI): Misha Pavel, (Northeastern Univ); Omer Inan, (Georgia Tech)
Chairs (BSN): Woon-Hong Yeo, (Georgia Institute of Technology); Bobak Mortazavi (Texas A&M)

18:10 - 19:10
Poster Session #2
Room: Main Hall C

BHI-T-1: Rescue Carbohydrate Suggestion Algorithm for Physical Activity in Type-1 Diabetes
Mert Sevil, Iman Hajizadeh, Mudassir Rashid and Sediqeh Samadi (Illinois Institute of Technology, USA); Mohammad Reza Askari (Illinois Institute of Technology, USA); Ali Cinar (Illinois Institute of Technology, USA)

BHI-T-2: Psychological Stress Detection Using Photoplethysmography
Mert Sevil and Mudassir Rashid (Illinois Institute of Technology, USA); Mohammad Reza Askari (Illinois Institute of Technology, USA); Sediqeh Samadi, Iman Hajizadeh and Ali Cinar (Illinois Institute of Technology, USA)

BHI-T-3: Leveraging Wearable Physical Activity Trackers to Improve Glucose Predictions for Personalized Medicine
Mert Sevil, Iman Hajizadeh, Mudassir Rashid, Zacharie Maloney, Sediqeh Samadi and Rachel Brandt (Illinois Institute of Technology, USA); Mohammad Reza Askari (Illinois Institute of Technology, USA); Nicole Hobbs (Illinois Institute of Technology, USA); Minsun Park and Laurie Quinn (University of Illinois at Chicago, USA); Ali Cinar (Illinois Institute of Technology, USA)

BHI-T-4: Mobile Application for Automated Insulin Delivery with Integrated Physical Activity Sensors
Caterina Lazaro, Mudassir Rashid, Mert Sevil, Iman Hajizadeh and Jeremy Hajek (Illinois Institute of Technology, USA); Erdal Oruklu (IIT, USA); Ali Cinar (Illinois Institute of Technology, USA)

BHI-T-5: Predicting Patients Vulnerable to Short-Term Readmission
Minjung Kim and Sara Tabtabai (UConn School of Medicine, USA)

BHI-T-6: Proposal of Health Index Measurement Using RGB Video Images
YU Ochiai (University of Ritsumeikan, Japan); Taiki Fujita (Ritsumeikan University, Japan)

BHI-T-7: BESI-C: Behavioral and Environmental Sensing and Intervention for Cancer
James A Hayes and Ridwan Alam (University of Virginia, USA); Nutta Homdee (University of Virginia; Link Lab, USA); John Lach, Virginia LeBaron and Katherine Gordon (University of Virginia, USA)

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BHI-T-8: Clustering single cell RNA-seq data using sparse autoencoders for dimension reduction
Shang Gao, Derek Reiman and Yang Dai (University of Illinois at Chicago, USA)

BHI-T-9: Chronic Kidney Disease Stage Classification from Renal Artery Doppler Image
Chun-Wei Hsieh (National Taiwan Ocean University, Taiwan); Munkhjargal Gochoo (National Taiwan Ocean University, Taiwan; Mongolian University of Science and Technology, Mongolia); Chien-Hung Lee and Yung-Chih Chen (Chang-Gung Memorial Hospital, Taiwan)

BHI-T-10: Development of Supporter for Tennis Elbow Prevention Using Viscoelasticity Component
Kazuma Fukuhara and Shima Okada (Ritsumeikan University, Japan); Masaaki Makikawa (College of Science and Engineering, Ritsumeikan University, Japan)

BHI-T-11: Virtual-Interviewer: A Conversational Agent Designed to Facilitate Cognitive Health Screening in Older Adults
Shahla Farzana and Natalie Parde (University of Illinois Chicago, USA)

BHI-T-12: Ballistocardiographic estimation of cardiac ejection curve for heartbeat detection
Moein Enayati (University of Missouri, Columbia, USA); Marjorie Skubic (University of Missouri, USA); Nasibeh Zanjirani Farahani (University of Missouri, Columbia, USA)

BHI-T-13: Opinions and Awareness Regarding the Use of Virtual and Augmented Reality Technologies in Healthcare
Parisis Gallos (National and Kapodistrian University of Athens, Greece); Charalabos Georgiadis (Aristotle University of Thessaloniki, Greece); Joseph Liaskos (National and Kapodistrian University of Athens, Greece); John Mantas (Health Informatics & IMIA, Greece)

BHI-T-14: CrowdHEALTH Project: Big Data Analytics Combined with Holistic Health Records for Healthcare Policy Making
Parisis Gallos (European Federation for Medical informatics, Lausanne, Switzerland); Serge Autexier (DFKI, Germany); Athanasios Kiourtis and Dimosthenis Kyriazis (University of Piraeus, Greece); Mitja Lustrek (Jozef Stefan Institute, Slovenia); Ilias Maglogiannis (University of Piraeus, Greece); John Mantas (European Federation for Medical informatics, Lausanne, Switzerland); Argyro Mavrogiorgou (University of Piraeus, Greece); Andreas Menychtas (BioAssist S.A., Greece); Vassilis Plagianakos (NOHS (EOPYY), Greece)

BHI-T-15: Circadian rhythm Estimation Using Smart Wear
Hazuki Masuda, Junshi Inoue, Shima Okada and Naruhiro Shiozawa (Ritsumeikan University, Japan); Masaaki Makikawa (College of Science and Engineering, Ritsumeikan University, Japan)

BHI-T-16: A Multimodal Deep Learning Framework for Influential Feature Selection and Prediction of Antigen Glycosylation
Saisubramaniam Gopalakrishnan (National University of Singapore & Institute for Infocomm Research, ASTAR*, Singapore); Venkata Krishnan Venkateswara (National University of Singapore, ASTAR*, Singapore); Jingyi Liao (National University of Singapore, A*STAR, Singapore); Songyou Peng, Zhang Le, Swan Ho Ying and Zeng Zeng (A*STAR, Singapore)

BHI-T-17: Two-stage pneumonia detection through object detection and patch classification
Sin Teo (Institute for Infocomm Research, Singapore); Yiling Chong (National University of Singapore, Singapore); Zeng Zeng (A*STAR, Singapore)

BHI-T-18: Bone Age Assessment based on Finger joint Localization
Zhang Xiaoman and Zhao Ziyuan (National University of Singapore, Singapore); Cen Chen (Hunan University, P.R. China); Le Zhang and Peng Songyou (I2R, Singapore); Min Wu (Institute for Infocomm Research, Singapore); Zhongyao Cheng (I2R, Singapore); Sin Teo (Institute for Infocomm Research, Singapore); Zeng Zeng (A*STAR, Singapore)

BHI-T-19: Monitoring Kinetic Estimated Glomerular Filtration Rate is Associated with Improved Vancomycin Dosing to Target
Mohammad Samie Tootooni, Erin Barreto, Danette Bruns, Kianoush Kashani and Kalyan Pasupathy (Mayo Clinic, USA)

BHI-T-20: SmartDiagnostics: A Mobile Application for the Monitoring and Management of Movement Disorders
Aparimit Chandra, Renos Zabounidis, Karine Tung and Hee-Tae Jung (University of Massachusetts Amherst, USA); Jean-Francois Daneault (Rutgers University, USA); Sunghoon Ivan Lee (University of Massachusetts, USA)

BHI-T-21: Power Spectral Change of EEG by Pink Noise Presentation
Taiki Fujita (Ritsumeikan University, Japan)

BHI-T-22: Use of the Fitbit for Free-Living Heart Rate Monitoring
Sophia Frohna (Northern Arizona University, USA); Greg Dominick (University of Delaware, USA); Kyle Winfree (Northern Arizona University, USA)

BHI-T-23: Heart Rate Estimation from Wristband Photoplethysmography
Mohammad Reza Askari (400 E. 33rd Street & Illinois Institute of Technology, USA); Mudassir Rashid, Mert Sevil, Iman Hajizadeh, Sediqeh Samadi and Ali Cinar (Illinois Institute of Technology, USA)

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BHI-T-24: A Novel Personalized Method for Detecting MNA in Smartphone PPG Signals
Fatemehsadat Tabei and Jo Woon Chong (Texas Tech University, USA)

BHI-T-25: A multimodal sensor fusion platform for objective assessment of motor states in Parkinson's disease
Mevludin Memedi (Örebro University, Sweden); Somayeh Aghanavesi (Dalarna University, Sweden); Filip Bergquist (Gothenburg University, Sweden); Dag Nyholm and Marina Senek (Uppsala University, Sweden)

BHI-T-26: A Novel Parallel Lattice Boltzmann Method on Large Scale Medical Image Segmentation
Fei Ge (INSA Lyon, France); Guy Courbebaisse (Institut National des Sciences Appliquées de Lyon, France)

BHI-T-27: Design and Development of Low-Cost Arduino-Based Electromyography for Home-Based Post-Stroke Rehabilitation
Idongesit Ekerete (Ulster University, United Kingdom (Great Britain)); Andrew Kerr (University of Strathclyde, United Kingdom (Great Britain))

BHI-T-28: Unobtrusive Measurement of Upper Extremity Velocity During Post-Stroke Rehabilitation Exercises
Oonagh Giggins (Dundalk Institute of Technology, Rep. of Ireland, Ireland); Matias Garcia-Constantino (Ulster University, United Kingdom (Great Britain)); Chris Nugent and James Mclaughlin (University of Ulster, United Kingdom (Great Britain)); Idongesit Ekerete (Ulster University, United Kingdom (Great Britain))

BHI-T-29: Unobtrusive Monitoring of Home-Based Post-Stroke Rehabilitation Exercises Using Heterogeneous Sensors
Idongesit Ekerete (Ulster University, United Kingdom (Great Britain)); Oonagh Giggins (Dundalk Institute of Technology, Rep. of Ireland, Ireland); Ian Cleland (Ulster University, United Kingdom (Great Britain)); Chris Nugent and James Mclaughlin (University of Ulster, United Kingdom (Great Britain))

BHI-T-30: A Fusion Approach for Automated Surgical Skill Assessment
Krittameth Teachasrisaksakul (Imperial College London, United Kingdom (Great Britain)); Surapa Thiemjarus and Sanparith Marukatat (National Electronics and Computer Technology Center, Thailand); Guang-Zhong Yang (Imperial College London, United Kingdom (Great Britain)); Benny Lo (Imperial College, United Kingdom (Great Britain))

BHI-T-31: Estimation of Total Body Water using Bioelectrical Impedance Analysis
Mst Farzana Khatun (Rajshahi University of Engineering & Technology, Bangladesh); Tahasin Ahmed Fahim (Rajshahi University of Enginnering & Technology, Bangladesh); Sajib Sen (University of Memphis, USA); Md Sohel Rana (Rajshahi University of Engineering & Technology, Bangladesh)

BHI-T-32: Linear Regression Models for Extracellular Fluid Measurement Based on Bioelectrical Impedance Analysis
Mst Farzana Khatun (Rajshahi University of Engineering & Technology, Bangladesh); Tahasin Ahmed Fahim (Rajshahi University of Enginnering & Technology, Bangladesh); Sajib Sen (University of Memphis, USA); Md Sohel Rana (Rajshahi University of Engineering & Technology, Bangladesh)

BHI-T-33: Mathematical Models for Intracellular Fluid Measurement Based on Bioelectrical Impedance Analysis
Mst Farzana Khatun (Rajshahi University of Engineering & Technology, Bangladesh); Tahasin Ahmed Fahim (Rajshahi University of Enginnering & Technology, Bangladesh); Sajib Sen (University of Memphis, USA); Md Sohel Rana (Rajshahi University of Engineering & Technology, Bangladesh)

BHI-T-34: Studying MCI to AD Conversion Radiomics-Based Survival Indexes by Machine Learning
Jorge Andres Orozco (Tecnologico de Monterrey, Mexico); Jose Tamez-Peña (Tecnológico de Monterrey, Mexico)

BHI-T-35: Personalised Monitoring and Recommendation Services for At-Risk Individuals Employing Machine-Learning and Decision Support
Konstantinos Perakis (UBITECH, Greece); Sotiris Kousouris (Suite5, Greece); Stamatis Pitsios and Dimitris Miltiadou (UBITECH, Greece); George Bikas (Suite5, Greece)

BHI-T-36: Feasibility of Early Prediction of Heart Failure in Critically-ill Patients using Tele-ICU Data
Patrick Essay and Vignesh Subbian (University of Arizona, USA); Baran Balkan (The University of Arizona, USA)

BHI-T-37: E-BAP: A scalable and flexible web-based software system to support self-management for behavior changes
Jannatul Ferdause Tumpa, Daniel Pinto and Riddhiman Adib (Marquette University, USA); Steven Cole (Renaissance School of Medicine at Stony Brook University, USA); Sheikh Ahamed (Marquette University, USA)

BHI-T-38: The Quantification of Accelerometer Noise Experienced During Wrist Motion
Surya Sharma and Adam Hoover (Clemson University, USA)

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BHI-T-39: Omega-3 Fatty Acid Treatment to Cortical Neurons after Mechanical Injury and Neuroprotective Characterization with Spatial Light Interference Microscopy
Darnella Cole (The University of West Alabama, USA); Jorge Maldonado and Catherine Best (University of Illinois at Urbana Champaign, USA)

BHI-T-40: A Reference Architecture for Predicting Resilience Levels of Women with Breast Cancer
Dimitris Fotiadis (Institute of Molecular Biology and Biotechnology, FORTH, Greece); Konstadina Kourou (Institute of Molecular Biology and Biotechnology, FORTH-IMBB, Greece); Haridimos Kondylakis and Lefteris Koumakis (Computational Biomedicine Laboratory, FORTH-ICS, Greece); Georgios C. Manikis (Foundation for Research and Technology, Greece); Kostas Marias (FORTH, Greece); Manolis Tsiknakis (FORTH/ TEI CRETE, Greece); Panagiotis Simos (School of Medicine, University of Crete, Greece); Evangelos Karademas (University of Crete, Greece)

BHI-T-41: Effect of Nuclear Confinement and Polymer Rigidity on Formation of Chromosome Interactions and Chromosome Territory
Samira Mali, Alan Perez-Rathke and Jie Liang (University of Illinois at Chicago, USA)

BHI-T-42: Mobile App for Advanced Prediction on Causal Chain of Death
Yuanda Zhu, Ryan Hoffman, Hung Vo and Kyla Qi (Georgia Institute of Technology, USA); May Dongmei Wang (Georgia Tech and Emory Univ, USA)

BHI-T-43: Knowledge-Guided Data Analytics for Determining Causal Chains of Death
Ying Sha and Hang Wu (Georgia Institute of Technology, USA); May Wang (Georgia Institute of Technology and Emory University, USA)

BHI-T-44: Tensor-based Brain Network Embedding in a Transdiagnostic Psychiatric Cohort
Paul J Thomas (University of Illinois at Chicago, USA); Bokai Cao (Facebook, Inc, USA); Philip Yu, Alex Leow, K. Luan Phan and Olusola Ajilore (University of Illinois at Chicago, USA)

BHI-T-45: Convolutional Neural Networks Based Random Projections Method with Application to EEG Prediction Tasks
Kartik Ahuja (University of California Los Angeles, USA); Mai Tran (UCLA, USA)

BHI-T-46: Development of a Functional Health Index for Older Adults using the Electronic Health Record
Anup Mishra (University of Missouri, Columbia, USA); Marjorie Skubic (University of Missouri, USA); Laurel A Despins (University of Missouri, Columbia, USA); Mihail Popescu, Marilyn Rantz and James Keller (University of Missouri, USA); Kari Lane (University of Missouri, Columbia, USA)

BHI-T-47: Stochastic Analysis of Nucleation Process of HIV-1 Capsid Protein by Solving Discrete Chemical Master Equation Using ACME
Farid Manuchehrfar and Jie Liang (University of Illinois at Chicago, USA)

BHI-T-48: Effects of Sizes and Shapes on Wound Healing Through Purse-String Mechanism
Pourya Delafrouz (University of Illinois at Chicago, USA); Jieling Zhao (Institut National de Recherche en Informatique et en Automatique, France); Wei Tian and Jie Liang (University of Illinois at Chicago, USA)

BHI-T-49: Transferability of Deep Learning Based Sleep Apnea Detection Models
Tom Van Steenkiste and Dirk Deschrijver (Ghent University - imec, Belgium); Tom Dhaene (Ghent University & IMEC, Belgium)

BHI-T-50: Bayesian Optimization of MRI k-Space Trajectories
Tom Van Steenkiste (Ghent University - imec, Belgium); Jan Aelterman (Ghent University-IMEC & IMEC, Belgium); Hiep Q Luong (Ghent University - IMEC, Belgium); Dirk Deschrijver (Ghent University - imec, Belgium); Tom Dhaene (Ghent University & IMEC, Belgium)

BHI-T-51: Predicting Blood Pressure Response to Sleep Apnea Treatment
Chirag Agarwal (University of Illinois at Chicago, USA); Elan Schonfeld (Glenbrook North High School, USA); Dan Schonfeld (University of Illinois, Chicago, USA); Babak Mokhlesi (University of Chicago, USA); Bharati Prasad (UI Health Sleep Sciences Center, USA)

BHI-T-52: Estimation of Sleep Stage by Head Motion
Motoki Yoshihi and Shima Okada (Ritsumeikan University, Japan); Masaaki Makikawa (College of Science and Engineering, Ritsumeikan University, Japan); Teruaki Nochino (Osaka University, Japan)

BHI-T-53: Promoting Patient Engagement Through Personalized Hospital-Stay Summaries
Sabita Acharya, Barbara Di Eugenio, Andrew Boyd, Richard Cameron, Karen Dunn Lopez, Pamela Martyn-Nemeth, Debaleena Chattopadhyay, Pantea Habibi, Carolyn Dickens, Haleh Vatani and Amer Ardati (University of Illinois at Chicago, USA)

BHI-T-54: Pervasive Sensing of Distress using Wearable Devices for People with Dementia
Joseph Howes, Zhaoyang Wang, Jian Zhan, Hanxiao Zhang and Yingnan Sun (Imperial College London, United Kingdom (Great Britain)); Benny Lo (Imperial College, United Kingdom (Great Britain))

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BHI-T-55: DeepSGUS: Fully convolutional neural network for semantic segmentation of Primary Sjögren's syndrome affected salivary glands from ultrasonography images
Arso Vukicevic (University of Kraguejvac, Serbia); Milos Radovic (BioIRC, Serbia); Alen Zabotti (Azienda Ospedaliero Universitaria Santa Maria Della Misericordia di Udine, Italy); Vera Milic (Institute of Rheumatology, School of Medicine University of Belgrade, Serbia); Salvatore De Vita (Udine University, Italy); Nenad Filipovic (University of Kragujevac, Serbia)

BHI-T-56: Our smeared FE model for electrophysiology coupled with heart muscle mechanics
Milos Kojic (Bioengineering Research and Development Center BioIRC, Serbia); Miljan Milosevic (Bioengineering Research and Development Center BioIRC & Metropolitan University Belgrade, Serbia); Vladimir Simic, Bogdan Milicevic and Vladimir Geroski (Bioengineering Research and Development Center BioIRC, Serbia); Nenad Filipovic (University of Kragujevac, Serbia)

BHI-T-57: Three-dimensional numerical analysis of atherosclerosis development within carotid artery
Smiljana Djorovic (Bioengineering Research and Development Center (BioIRC), Serbia); Igor Saveljic (Bioengineering Research and Development Center, BioIRC, Serbia); Nenad Filipovic (University of Kragujevac, Serbia)

BHI-T-58: Numerical Simulation of Implantation of Stent Within Artery with Deformable Wall
Tijana Djukic and Igor Saveljic (Bioengineering Research and Development Center, BioIRC, Serbia); Gualtiero Pelosi and Oberdan Parodi (Institute of Clinical Physiology, National Research Council, Pisa, Italy); Nenad Filipovic (University of Kragujevac, Serbia)

BHI-T-59: Numerical analysis of two hip implant surfaces
Aleksandra Vulovic (Faculty of Engineering, University of Kragujevac, Serbia); Nenad Filipovic (University of Kragujevac, Serbia)

BHI-T-60: Development of a Microwave Imaging System with Applications in Medical Imaging and Treatment of Cancer Patients
Nesreen Alsbou and Joshua Branscum (University of Central Oklahoma, USA); Imad Ali (University of Oklahoma Health Sciences Center, USA)

BHI-T-61: Bladder Volume Estimation by Electrical Impedance Measurement with Fewer Electrodes Using Linear Regression
Shuhei Noyori, Hiroshi Noguchi, Taketoshi Mori and Hiromi Sanada (The University of Tokyo, Japan)

BHI-T-62: Preliminary Modeling of the Kinetics of Photoplethysmogram Changes Following Non-Invasive Vagus Nerve Stimulation
Asim H Gazi, Nil Z Gurel and Kristine Scott (Georgia Institute of Technology, USA); Matthew T Wittbrodt (Emory University, USA); Amit J Shah and Viola Vaccarino (Rollins School of Public Health, USA); Douglas Bremner (Emory School of Medicine, USA); Omer T Inan (Georgia Institute of Technology, USA)

BHI-T-63: Participative app for citizen to assess health risks and increase pollution awareness
Manuel Ottaviano (Universidad Politecnica de Madrid, Spain); Jose G. Terius-Padron (Universidad Politecnica de Madrid & Life Supporting Technologies, Spain); Sergio Gonzalez-Martinez (Universidad Politecnica de Madrid, Spain); Gloria Cea (Universidad Politécnica de Madrid, Spain); Maria Fernanda Cabrera-Umpierrez and Maria Teresa Arredondo (Life Supporting Technologies; Technical University of Madrid, Spain); Sergio Guillén (Ronda Auguste y Louis Lumiere, Spain)

BHI-T-64: Development and validation of algorithms for remote motor therapy in Parkinson' disease
Patricia Abril-JImenez (Universidad Politecnica de Madrid, Spain); Javier Rojo Lacal and Samanta Villanueva Mascato (Universidad Politécnica de Madrid, Spain); Silvia de los Rios (Universidad Politecnica de Madrid, Spain); Maria Fernanda Cabrera-Umpierrez and Maria Teresa Arredondo (Life Supporting Technologies; Technical University of Madrid, Spain); Fabricio Basso (Universidad Nacional de Mar del Plata, Spain)

BHI-T-65: Validation of a Food Image Classifier Based on the Top 50 Consumed Foods from the What We Eat in America Survey
Jenna Kim (University of Washington, USA); Shuhao Lin (University of Illinois at Chicago, USA); Giannina Ferrara (Institute of Health Metrics and Evaluation, USA); Jenna Hua (Stanford Prevention Research Center & Stanford University, USA); Edmund Seto (University of Washington, USA)

BHI-T-66: Rapid Detection of Heart Rate Fragmentation and Cardiac Arrhythmias: Cycle-by-cycle analysis using rr, Supervised Machine Learning Model, RR Statistical Analysis, and Novel Insights
Ananya Rajagopalan (Redmond HS, USA); Marcus Vollmer (University Medicine Greifswald, USA)

BHI-T-67: Topological Characterization of High Dimensional Probability Landscapes and Their Dynamical Changes
Wei Tian (University of Illinois at Chicago, USA); Hubert Wagner and Herbert Edelsbrunner (Institute of Science and Technology Austria, Austria); Jie Liang (University of Illinois at Chicago, USA)

BHI-T-68: Predicting Personalize Lung Healthiness Risk Scores to Identify Probability of an Asthma Attack
Quan Do, Alexa Doig and Son Tran (New Mexico State University, USA)

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BHI-T-69: Physics-Based Modeling of Arterial Hemodynamics in Humans: Tapered versus Uniform Tube-Load Models
Azin Mousavi and Ali Tivay (University of Maryland, USA); Rama Mukkamala (Michigan State University, USA); Barry Finegan (University of Alberta, Canada); M Sean McMurtry (University of Alberta, USA); Jin-Oh Hahn (University of Maryland, USA)

BHI-T-70: ALL-ResNet: White Blood Cancer Microscopic Images Classification with Deep Neural Network
Quan Liu and Shuxiang Zhu (Case Western Reserve University, USA); Huan Chen (CWRU, USA); Haotian Jiang, Xiaoye Qian and Ming-Chun Huang (Case Western Reserve University, USA)

BHI-T-71: Melanoma Image Segmentation via Multiple Random Walker Approach
Golnoush Asaeikheybari (Case Western Reserve University, USA); Justin Green (CWRU, USA); Xiaoye Qian, Haotian Jiang and Ming-Chun Huang (Case Western Reserve University, USA)

BHI-T-72: Kidney Tomosynthesis with Point-by-point Back Projection
Allison McMinn and Ying Chen (Southern Illinois University Carbondale, USA)

BHI-T-73: Robust Continuous Heart Rate Estimation Using Neck Photoplethysmography During Physiological Interventions
Karam Choi, HyunSeok Moon, Seung Keun Yoon, Soyoung Lee, Eui Seok Shin, Byung-hoon Ko, Uikun Kwon and Sung Hyun Nam (Samsung Advanced Institute of Technology, Samsung Electronics)

BHI-T-74: Quantification of Hemodynamic Responses to Diuretic Changes in Patients with Heart Failure using Ballistocardiogram and Electrocardiogram Recordings
Beren Semiz (Georgia Institute of Technology, USA); Mobashir Shandhi (Georgia Tech, USA); Joanna Fan (University of California, San Francisco, USA); Sean Dowling (University of California San Francisco, USA); Liviu Klein (University of California, San Francisco, USA); Omer T Inan (Georgia Institute of Technology, USA)

BHI-T-75: Smartphone Blood Pressure Monitoring
Anand Chandrasekhar and Keerthana Natarajan (Michigan State University, USA); Chang-Sei Kim (Chonnam National University, Korea); Mohammad Yavarimanesh and Mohhammed Naji (Michigan State University, USA); Jin-Oh Hahn (University of Maryland, USA); Rama Mukkamala (Michigan State University, USA)

BHI-T-76: Conventional Pulse Transit Times as Markers of Blood Pressure
Keerthana Natarajan and Mohammad Yavarimanesh (Michigan State University, USA); Robert Block (University of Rochester, USA); Andrew Carek (Georgia Tech, USA); Junxi Zhu (University of Maryland, USA); Giovanni Schifitto (University of Rochester, USA); Omer T Inan (Georgia Institute of Technology, USA); Jin-Oh Hahn (University of Maryland, USA); Rama Mukkamala (Michigan State University, USA)

BHI-T-77: Correction to the Bramwell-Hill Equation for Changes in Arterial Cross-Sectional Area
Mohammad Yavarimanesh and Anand Chandrasekhar (Michigan State University, USA); Jin-Oh Hahn (University of Maryland, USA); Rama Mukkamala (Michigan State University, USA)

BHI-T-78: Theoretical Analysis of the Maximum Slope Algorithm for Oscillometric Blood Pressure Estimation
Anand Chandrasekhar, Mohammad Yavarimanesh and Rama Mukkamala (Michigan State University, USA)

BHI-T-79: The 10 Most Important Features in Predicting Depression from Content of Retrospectively Harvested Text Messages
Monica L. Tlachac and Elke Rundensteiner (Worcester Polytechnic Institute, USA)

BHI-T-80: Effect of short-term sling exercise with whole body vibration recovery on heart rate and lactic acid level variability
Hyun Ji Woo (Chonbuk National University, Korea)

BHI-T-81: Chromosomal Architecture on Oncogenic Loci and Mutations in Non-coding Region
Lin Du, Alan Perez-Rathke and Jie Liang (University of Illinois at Chicago, USA)

BHI-T-82: Sleep Stage Estimation Using Smart Wear
Hirotaka Matsumoto, Shima Okada and Naruhiro Shiozawa (Ritsumeikan University, Japan); Masaaki Makikawa (College of Science and Engineering, Ritsumeikan University, Japan)

BHI-T-83: Machine Learning-based Fluid Intake Activity Recognition Using Wearable Sensor
Hsiang-Yun Huang, Chia-Yeh Hsieh and Kai-Chun Liu (National Yang-Ming University, Taiwan); Steen J. Hsu (Ming Hsin University of Science and Technology, Taiwan); Chia-Tai Chan (National Yang-Ming University, Taiwan)

BHI-T-84: Convolutional Neural Networks for Breast Ultrasound Image Segmentation
Yaobin Liang, Juan Shan, David Benjamin and Rania Almajalid (Pace University, USA)

BHI-T-85: Bone Segmentation in 3D Knee MRI Images Using U-Net
Tomer Alon and Juan Shan (Pace University, USA); Maolin Zhang (Hopewell Valley Central High School, USA); Joe Delvecchio and Ming Zhang (Wentworth Institute of Technology, USA)

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BHI-T-86: Using Virtual Reality Game Environments to Empathize and Care for Patients Diagnosed with Schizophrenia
Sudhanshu Semwal (University of Colorado, Colorado Springs, USA); Abhishek Chepe and Deborah Pina-Thomas (University of Colorado Colorado Springs, USA)

BHI-T-87: ESP: Euclidean Spheres Packing Implementation for Volume Data Using Slicer3D
Sudhanshu Semwal (University of Colorado, Colorado Springs, USA); Anod Alhazmi (University of Colorado at Colorado Springs, Colorado, USA)

BHI-T-88: Comparison of MR Elastography data from the mouse brain using single-frequency algebraic inversion and MDEV inversion
Shreyan Majumdar and Dieter Klatt (University of Illinois at Chicago, USA)

BHI-T-89: Classifying Impaired Awareness of Hypoglycemia with Convolutional Neural Networks
Maitrey Mehta, Danielle Groat, Yu Kuei Lin, Ramkiran Gouripeddi and Julio Facelli (University of Utah, USA)

BHI-T-90: Assessment of Hand Movement Efficiency in a Rehabilitation Game
Mengxuan Ma (University of Missouri - Columbia, USA); Teresa Tang (David H. Hickman High School, Columbia, MO, USA); Haiyan Hu and Rachel Proffitt (University of Missouri - Columbia, USA); Marjorie Skubic (University of Missouri, USA)

BHI-T-91: Classification among AD, MCI, and Healthy Controls Using Relative EEG Powers Selected by Fisher Scores
Yi-Hung Liu (National Taipei University of Technology, Taiwan); Chia Fen Tsai (Taipei Veterans General Hospital, Taiwan); Chien-Te Wu (National Taiwan University, Taiwan); Chun-Hung Huang and Shih-Chun Hsieh (National Taipei University of Technology, Taiwan)

BHI-T-92: Investigating Effects of Pressure Signal Characteristics on Hemodynamic Measurement Performance
Christopher G Scully and Hossein Mirinejad (US Food and Drug Administration, USA); Sandy Weininger (U.S. Food and Drug Administration & Center for Devices and Radiological Health, USA)

BHI-T-93: Detection algorithm for human gingival sulcus in cross section images by averaged intensity difference
Naresh Kumar Ravichandran, Hoseong Cho, Jaeyul Lee and Sangyeob Han (Kyungpook National University, Korea); Ruchire Eranga Wijesinghe (Kyungil University, Korea); Pilun Kim, Seung-Yeol Lee and Hee-Young Jung (Kyungpook National University, Korea); Joon Ki Kim (LIGNex1 Co., Ltd., Korea); Mansik Jeon (Kyungpook National Univerisity, Korea); Jeehyun Kim (Kyungpook National University, Korea)

BHI-T-94: Oscillations in the Feedback Gene Regulatory Motifs with Slow Promoter Dynamics
Anna Terebus (UIC, USA); Jie Liang (University of Illinois at Chicago, USA)

BHI-T-95: Using Electrodermal Activity for Automatic Posture Detection
Alec Steele and Mehrdad Nourani (University of Texas at Dallas, USA); Dennis Sullivan (University of Arkansas for Medical Sciences, USA)

BHI-T-96: How does gender innovation contribute to the analysis of elderly person's voice?
Jiyeoun Lee (Jungwon University, Korea)

BHI-T-97: CAVA: A System for Identifying Nystagmus
Jacob Newman (University of East Anglia, United Kingdom (Great Britain)); John Phillips (Norfolk & Norwich University Hospital & University of East Anglia, United Kingdom (Great Britain)); Stephen Cox (University of East Anglia, United Kingdom (Great Britain))

BHI-T-98: In Situ Assessment of Muscle Contusion Recovery with Ultrasound Image Textures and Quantitative Parameters
Da-Ming Huang, Zih-You Yu and Shyh-Hau Wang (National Cheng Kung University, Taiwan)

BHI-T-99: Using Autoencoders for Predicting Latent Microbiome Community Shifts Responding to Dietary Changes
Derek Reiman and Yang Dai (University of Illinois at Chicago, USA)

BHI-T-100: A Public Health Platform for Acquiring Contextual Longitudinal Data on the Affect, Behaviors, and Interactions of Populations
Bilal Khan, Kirk Dombrowski, Gisela Font Sayeras, Alekhya Bellam, Kin Pi and Devan Crawford (University of Nebraska-Lincoln, USA)

BHI-T-101: Population based screening for assessment of falls and mobility using wearable sensors
Barry R. Greene and Killian McManus (Kinesis Health Technologies, Ireland); Brian Caulfield (University College Dublin, USA)

BHI-T-102: Multi-scale investigation of relationship between inter-hemispheric cerebral perfusion asymmetry and carotid artery stenosis
Amir A Khan (George Mason University, USA); Jigar Patel (Imaging Service, VA Maryland Health Care System, Baltimore, Md, USA); Matthew Chrencik and Anthony Laila (University of Maryland School of Medicine, Baltimore, Md, USA); Nathaniel Woycke and Siddhartha Sikdar (George Mason University, USA); Brajesh Lal (University of Maryland School of Medicine, Baltimore, Md, USA)

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BHI-T-103: Signal detection in extracellular neural ensemble recordings using higher criticism
Farzad Fathizadeh (Swansea University, United Kingdom (Great Britain)); Ekaterina Mitricheva, Rui Kimura and Nikos Logothetis (Max Planck Institute for Biological Cybernetics, Germany); Hamid R. Noori (Max Planck Institute for Biological Cybernetics & New York University, Germany)

BHI-T-104: An Infrastructure for a Natural Language-Driven Smartphone Healthcare Monitor and Advisor that uses Wearable Technologies
George Stefanek, Marianne Curia and Janet Garwood (Purdue University Northwest, USA)

BHI-T-105: HoloTeacher: Teaching CPR with HoloLens Augmented Reality
Agnes Gruenerbl (DFKI, Germany); Hamraz Javaheri (German Research Center for Artificial Intelligence, Germany); Eloise Monger and Mary Gobbi (University of Southampton, United Kingdom (Great Britain)); Paul Lukowicz (DFKI and University of Kaiserslautern, Germany)

BHI-T-106: 3D modeling of atherosclerosis progression in coronary arteries
Igor Saveljic (Bioengineering Research and Development Center, BioIRC, Serbia); Dalibor Nikolic (Bioengineering Research and Development Center, Serbia); Tijana Djukic (Bioengineering Research and Development Center, BioIRC, Serbia); Gualtiero Pelosi and Oberdan Parodi (Institute of Clinical Physiology, National Research Council, Pisa, Italy); Nenad Filipovic (University of Kragujevac, Serbia)

BHI-T-107: Parametric optimization of stent design based on FE analysis
Dalibor Nikolic (Bioengineering Research and Development Center, Serbia); Igor Saveljic (Bioengineering Research and Development Center, BioIRC, Serbia); Nenad Filipovic (University of Kragujevac, Serbia)

BHI-T-108: 1-Norm: A novel image processing technique to investigate the influence of inhomogeneities on the scattering of mechanical waves in soft biological tissues
Harish Palnitkar, Rolf Reiter, Martina Guidetti, Shreyan Majumdar and Ramille Shah (University of Illinois at Chicago, USA); Thomas J Royston (851 South Morgan Street MC 063 & University of Illinois at Chicago, Richard and Loan Hill Departm, USA); Dieter Klatt (University of Illinois at Chicago, USA)

BHI-T-109: Clinical and Computational Comparison of Auscultatory Percussion for Alternative Detection Method of ACS
Bekah Allen, Jonathan Alcantar, Harish Palnitkar and Robert Molokie (University of Illinois at Chicago, USA); Thomas J Royston (University of Illinois at Chicago)

BHI-T-110: Signal Classification of Wearable Inertial Motion Sensor Data Using a Convolutional Neural Network
John D Ralston (Protxx, Inc, USA); Andreas Hauenstein and Joshua Roper (PROTXX, Inc., USA); Andreas Ralston (Protxx, Inc, USA)

BHI-T-111: Predictive modeling for disease management in distributed environments using incremental learning: a case study
Vasileios C. Pezoulas (University of Ioannina, Greece); Themis Exarchos (Institute of Molecular Biology and Biotechnology, FORTH, Greece); Athanasios Tzioufas (National and Kapodistrian University of Athens, Greece); Salvatore De Vita (Udine University, Italy); Dimitris Fotiadis (Institute of Molecular Biology and Biotechnology, FORTH, Greece)

BHI-T-112: Noninvasive Vagal Nerve Stimulation Effects on Anger Response
Nil Z Gurel (Georgia Institute of Technology, USA); Matthew T Wittbrodt (Emory University, USA); Amit J Shah and Viola Vaccarino (Rollins School of Public Health, USA); Omer T Inan (Georgia Institute of Technology, USA); Douglas Bremner (Emory School of Medicine, USA)

BHI-T-113: A Deep Neural Network Based Method for Identifying Interaction between Compound and Protein
Fan Hu, Jiaxin Jiang, Jianye Zhang and Peng Yin (Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, P.R. China)

BHI-T-114: A Focused Caregiving Mobile App for Alzheimer's Patients
Nafees Qamar and Ning Lu (Governors State University, USA)

BHI-T-115: DeLHCA: Deep transfer learning for high-content analysis of the effects of drugs on immune cells
Shaista Hussain and Ankit Das (Institute of High Performance Computing, Singapore); Binh P. Nguyen (Victoria University of Wellington, New Zealand); Mardiana Marzuki (Singapore Immunology Network, Singapore); Shuping Lin and Graham Wright (Skin Research Institute of Singapore, Singapore); Amit Singhal (Singapore Immunology Network, Singapore)

BHI-T-116: LATE NEWS: Keratoconus Detection Using Smartphone
Behnam Askarian, Kamrul Foysal and Jo Woon Chong (Texas Tech University, USA)

BHI-T-117: LATE NEWS: A Novel Personalized Method for Eye Fatigue Detection
Ayush Dhananjay Modani, Kamrul Foysal and Jo Woon Chong (Texas Tech University, USA)

Tuesday, May 21

BHI-T-118: LATE NEWS: Performance of Non-Contact Heart Rate Monitoring Methods using Smartphones/Webcam Camera
Monay Shoushan and Kamrul Foysal (Texas Tech University, USA); Bersain Reyes and Aldo Rodriguez (UASLP, San Luis Potosi, Mexico); Kwanghee Jung and Jo Woon Chong (Texas Tech University, USA)

BHI-T-119: LATE NEWS: A Novel Infrared Camera-based Sedentary Time Monitoring Method
Kamrul Foysal and Jo Woon Chong (Texas Tech University, USA)

BHI-T-120: LATE NEWS: Deep Transductive Learning for Brain MR Imaging Segmentation
Tiancheng He (Houston Methodist Hospital, USA); Lei Wang (Xidian University, P.R. China); Zhong Xue and Stephen Wong (Houston Methodist Cancer Center, USA)

BHI-T-121: LATE NEWS: Deep learning to automate analysis of high-content screening images of Epithelial-mesenchymal transition
Yunjie He (Houston Methodist Cancer Center, USA); Lei Huang (Houston Methodist Cancer Center & Houston Methodist Hospital, USA); Xiaoyun Xu and Xin Wang (Houston Methodist Cancer Center, USA); Tiancheng He (Houston Methodist Hospital, USA); Vivek Mittal and DingCheng Gao (Weill Cornell Medicine of Cornell University, USA); Stephen Wong (Houston Methodist Cancer Center, USA)

BHI-T-122: LATE NEWS: On the Predictability of Ventilator-Associated Events in Pediatrics Using Novel Risk Analytics
Adam R Tomczak, Dimitar Baronov, Kathryn Clark and Conor Holland (Etiometry, USA)

BHI-T-123: LATE NEWS: An Informatics System for Personal Exposure Feature Extraction for the NIH PRISMS Children's Asthma Program
Edmund Seto, Graeme Carvlin, Jeffry Shirai and Elena Austin (University of Washington, USA)

BHI-T-124: LATE NEWS: Co-creation of Virtual Reality Re-Usable Learning objectives for 360° video scenarios for the surgical excision of skin lesion
Kleanthis Neokleous (University of Cyprus, Cyprus); Evangelia Gkougkoudi (University of Cyprus & Medical School, Cyprus); Marios Hatziaros and Eirini Schiza (RISE, Cyprus); Maria Matsangidou (University of Kent, unknown); Marios Avraamides (RISE, Cyprus); Stathis Konstantinidis (University of Nottingham, United Kingdom (Great Britain)); Panagiotis Bamidis (Aristotle University of Thessaloniki, Greece); Constantinos Pattichis (University of Cyprus, Cyprus)

BHI-T-125: LATE NEWS: Medical Electronic-Textile Sensor Simulation and Signal Classification Modeling
Yu-Jiun Ren, Steve Eggleston and Yexian Qin (LR Technologies, Inc., USA)

BHI-T-126: LATE NEWS: Identification of Malignant Liver Tissues in PET images Using K-means Clustering Technique Based on Pixel Intensity
Gamal Geweid (University of North Dakota & School of Electrical Engineering and Computer Science, USA)

BHI-T-127: LATE NEWS: Cardiac Ultrasound Left Ventricular Image Sequence Tracking
Wei-Yen Hsu (National Chung Cheng University, Taiwan)

BHI-T-128: LATE NEWS: Predicting Vasopressor Interventions in Critically Ill Patients
Joseph Futoma (Harvard University & Duke University, USA); Finale Doshi-Velez (Harvard, USA); Rishikesan Kamaleswaran (University of Tennessee Health Science Center, USA)

BSN-T-1: Monitoring of Posture and Activity Using Smart Wearable Concepts
Markus Johannes Lueken, Beatrice Martin and Berno J.E. Misgeld (RWTH Aachen University, Germany); Steffen Leonhardt (RWTH Aachen, Germany)

BSN-T-2: Feasibility study of heart rate monitoring from ankle PPG data
Arturo Vazquez, Alexander J Casson and Ertan Balaban (The University of Manchester, United Kingdom (Great Britain))

BSN-T-3: Estimation of Dining Plate Diameter From an Egocentric Image Sequence without Using a Fiducial Marker
Zekun Wu, Wenyan Jia and Shunxin Cao (University of Pittsburgh, USA); Zhi-Hong Mao (University of Pittsburg, USA); Mingui Sun (University of Pittsburgh, USA)

BSN-T-4: Studying the interplay of individual and contextual factors to physiological-based models of public speaking anxiety
Megha Yadav, Theodora Chaspari and Amir Behzadan (Texas A&M University, USA)

BSN-T-5: Exploring the Validity of Heart Rate Variability Measured by E4 Wristbands in Concussion Patients
Halil Bisgin (The University of Michigan - Flint, USA); Neslihan Bisgin (University of Arkansas at Little Rock, USA); Yusuf Korkmaz and Bara Alsalaheen (University of Michigan-Flint, USA)

BSN-T-6: Portable device for quantifying artery blood mobility towards early diagnosis of vascular disease
Liaohai Leo Chen (The University of Illinois at Chicago, USA); Roberto Bustos, Valentina Valle, Gabriela Aguiluz Cornejo and Pier Giulianotti (University of Illinois, USA); Albert Chen (Hinsdale Central High School, USA)

Tuesday, May 21

BSN-T-7: Polyp Localization in Wireless Capsule Endoscopy Using Segmentation Network Trained with Colonoscopy Images and Coarse Labels
Yuqi Jiang (The Chinese University of Hong Kong, Hong Kong); Wan Yee Lo (the Chinese University of Hong Kong & Hong Kong, Hong Kong); Ruikai Zhang, Ruoxi Yu and Carmen Poon (The Chinese University of Hong Kong, Hong Kong)

BSN-T-8: Embedded Sensor System to Monitor Beverage Intake Type and Volume
Mahdi Pedram, Hassan Ghasemzadeh and Seyed Ali Rokni (Washington State University, USA); Ramin Fallahzadeh (Stanford University, USA)

BSN-T-9: Remote Gait Analysis Using Wearable Sensors Detects Asymmetric Gait Patterns in Patients Recovering from ACL Reconstruction
Reed D Gurchiek, Rebecca H Choquette, Bruce D Beynnon, James R Slauterbeck, Timothy W Tourville, Michael J Toth and Ryan S McGinnis (University of Vermont, USA)

BSN-T-10: BigFoot: A Mobile Solution toward Foot Parameters Extraction
Kevin Yiu-Wah Cheung (University at Buffalo, SUNY, USA); Darasy Reth (Northeastern University, USA); Chen Song (The State University of New York at Buffalo, USA); Wenyao Xu (SUNY Buffalo, USA)

BSN-T-11: EXTRA: Exercise Tracking and Analysis Platform for Remote-monitoring of Knee Rehabilitation
Migyeong Gwak, Shayan Fazeli and Ghazaal Ershadi (University of California, Los Angeles, USA); Majid Sarrafzadeh (UCLA, USA); Melina Ghodsi (Orange Lutheran High School, USA); Afshin Aminian and John Schlechter (Children's Hospital of Orange County, USA)

BSN-T-12: Explore Correlation Between Body Balance and Perception using mHealth Technology
Ridaa Z Ali, Jia Chen, Jianian Zheng and Ming-Chun Huang (Case Western Reserve University, USA)

BSN-T-13: A Wearable RFID System to Monitor Hand Use for Individuals with Upper Limb Paresis
Sunghoon Ivan Lee (University of Massachusetts, USA); Youngkyun Lee, Xin Liu and Jeremy Gummeson (University of Massachusetts Amherst, USA)

BSN-T-14: Robust Sensor-based Human Activity Recognition with Snippet Consensus Neural Networks
Yu Huang, Meng Chieh Lee and Vincent S. Tseng (National Chiao Tung University, Taiwan); Ching-Jui Hsiao and Chi-Chiang Huang (Compal Electronics, Inc., Taiwan)

BSN-T-15: Upper Limb Muscle Force Estimation During Table Tennis Strokes
Yiming Guo (University of Chinese Academy of Sciences, P.R. China); Yingfei Sun (Sensors Network and Applications Research Center, UCAS, P.R. China); Yi Ren (University of Chinese Academy of Sciences, P.R. China); Zhipei Huang (Graduate University of Chinese Academy of Sciences, P.R. China); Jiankang Wu (University of Chinese Academy of Sciences, P.R. China); Zhiqiang Zhang (University of Leeds, United Kingdom (Great Britain))

BSN-T-16: A Simulation-based Feasibility Study of a Proprioception-inspired Sensing Framework for a Multi-DoF Shoulder Exosuit
Rejin Varghese (Imperial College London, United Kingdom (Great Britain)); Xiaotong Guo (Hamlyn Centre, United Kingdom (Great Britain)); Daniel Freer (Imperial College London, United Kingdom (Great Britain)); Jindong Liu (University of Sunderland, United Kingdom (Great Britain)); Guang-Zhong Yang (Imperial College London, United Kingdom (Great Britain))

BSN-T-17: 3D Reconstruction of Dining Bowl for Image-Based Food Volume Estimation (Live Demo)
Wenyan Jia, Shunxin Cao and Zekun Wu (University of Pittsburgh, USA); Zhi-Hong Mao (University of Pittsburg, USA); Mingui Sun (University of Pittsburgh, USA)

BSN-T-18: A Finger-Worn Sensor Network for Monitoring the Real-World Performance of Stroke Survivors (Live Demo)
Jeremy Yang (University of Massachusetts Amherst, USA); Adam Varga (ArcSecond, Inc., USA); Karine Tung, Aparimit Chandra and Brandon Oubre (University of Massachusetts Amherst, USA); Nathan Ramasarma (ArcSecond Inc., USA); Eun Kyoung Choe (University of Maryland, USA); Paolo Bonato (Harvard Medical School, USA); Sunghoon Ivan Lee (University of Massachusetts, USA)

BSN-T-19: NFC-powered flexible chest patch for fast assessment of cardiovascular, hemodynamic and endocrine parameters (Live Demo)
Bruno Miguel Gil Rosa (Hamlyn Centre & Imperial College London, United Kingdom (Great Britain)); Salzitsa Anastasova (Imperial College, London, United Kingdom (Great Britain)); Benny Lo (Imperial College, United Kingdom (Great Britain)); Guang-Zhong Yang (Imperial College London, United Kingdom (Great Britain))

BSN-T-21: Design of a Smart Cushion Integrated with E-Textiles (Live Demo)
Gozde Cay (University of Rhode Island, USA); Nicholas Constant (204 Coit Ave., USA); Shimra Fine, Vanessa Kamara and Kunal Mankodiya (University of Rhode Island, USA)

BSN-T-22: E-Textile Glove Monitoring Finger and Hand Motion (Live Demo)
Kunal Mankodiya (University of Rhode Island, USA); Nicholas Constant (204 Coit Ave., USA); Joshua Gyllinsky, Mohammadreza Abtahi and Yalda Shahriari (University of Rhode Island, USA); Umer Akbar (Brown University, USA)

Wednesday, May 22

BHI-BSN Joint Keynote Speaker: John Rogers (Northwestern University): "Soft Electronic and Microfluidic Systems for the Skin"

9:00

F-DIT-V: An Automated Video Classification Tool for Facial Weakness Detection

Yan Zhuang, Omar Uribe, Mark Mcdonald, Xuwang Yin, Dhyey Parikh, Andrew Southerland and Gustavo Rohde (University of Virginia, USA)

9:15

Extracting Most Impacting Emergency Department Patient Flow By Embedding Laboratory-confirmed and Clinical Diagnosis on The Stiefel Manifold

Guillaume Bouleux (University of Lyon, INSA Lyon, DISP, France); Vincent Cheutet and Clement Pealat (Univ Lyon, INSA-Lyon, DISP, France)

9:30

Machine Learning of Psychological Stress to Relate to Suicidal Ideation

Gen-Min Lin (Hualien Armed Forces General Hospital, Taiwan); Chin Lin (National Defense Medical Center, Taiwan)

9:45

Comparing General and Locally-Learned Word Embeddings for Clinical Text Mining

Jidapa Thadajarassiri, Cansu Sen, Thomas Hartvigsen, Xiangnan Kong and Elke Rundensteiner (Worcester Polytechnic Institute, USA)

9:00

Selecting the Mammographic-View for the Parenchymal Analysis Based Breast Cancer Risk Assessment

Oscar Araque and María Mejía-Sandoval (Universidad Industrial de Santander, Colombia); Antti Sassi, Kirsi Holli-Helenius, Anna-Leena Lääperi, Irina Rinta-Kiikka and Otso Arponen (Tampere University Hospital, Finland); Said Pertuz (Universidad Industrial de Santander, Colombia)

9:15

Classification before Segmentation: Improved U-Net Prostate Segmentation

Ronald J Nowling (Milwaukee School of Engineering, USA); John D Bukowy, Sean D Mcgarry and Andrew S. Nencka (Medical College of Wisconsin, USA); Oliver Blasko (Milwaukee School of Engineering, USA); Jay Urbain (Milwaukee School of Engineering & Medical College of Wisconsin, USA); Allison Lowman, Alexander Barrington, Anjishnu Banerjee, Kenneth A Iczkowski and Peter S LaViolette (Medical College of Wisconsin, USA)

9:30

Deep Learning for Assessing Image Focus for Automated Cervical Cancer Screening

Peng Guo and Sanjana Singh (National Institutes of Health, USA); Zhiyun Xue (National Library of Medicine, USA); Rodney Long and Sameer Antani (NIH, USA)

9:45

An Accurate and Efficient Instrument for Monitoring Chest Wall Therapy

Nahom Kidane and Mohammad F. Obeid (Old Dominion University, USA); Antarius Daniel, Robert Kelly and Robert Obermeyer (Children's Hospital of The King's Daughters, USA); Frederic McKenzie (Old Dominion University, USA)

10:00

An AI-based Framework for Supporting Large Scale Automated Analysis of Video Capsule Endoscopy

Daniela Giordano, Francesca Murabito, Simone Palazzo, Carmelo Pino and Concetto Spampinato (University of Catania, Italy)

Wednesday, May 22

10:15
Speeding Up Resting State Networks Recognition via a Hardware Accelerator
Filippo Carloni (Politecnico di Milano, Italy); Giada Casagrande (Università di Pisa, Italy); Valentina Corbetta (Politecnico di Milano, Italy); Andrea Agostinelli (Imperial College London, United Kingdom (Great Britain)); Emanuele Del Sozzo and Luca Cerina (Politecnico di Milano, Italy); Marco D Santambrogio (Politecnico di Milano & MIT, Italy)

9:00 - 10:30
BSN Special Session # 2 - Body Sensor Networks and Machine Learning for Mental Health
Room: Meeting Room F
Chair: Benny Lo (Imperial College, United Kingdom (Great Britain)), Jeff Palmer (Massachusetts Institute of Technology)

9:00
Invited talk: Computational Psychophysiology Based Emotion Analysis for Mental Health
Prof Bin Hu (Lanzhou University, China)

9:30
Invited talk: A Multi-Modal Body Sensor Network for Mental Disease Detection Based on Decision-Level Fusion Framework of Modular Structure
Wei Chen and Xinyu Jiang (Fudan University, P.R. China)

10:00
Cellphone Augmented Reality Game-based Rehabilitation for Improving Motor Function and Mental State after Stroke
Xinyu Song (School of Mechanical Engineering, Shanghai Jiaotong University, P.R. China); Li Ding (Fudan University, P.R. China); Jiachen Zhao (Nanjing University of Chinese Medicine, P.R. China); Jie Jia (Fudan University, P.R. China); Peter Shull (Shanghai Jiao Tong University, P.R. China)

10:30 - 10:45
Coffee Break
Room: Main Hall AB

10:45 - 11:30
Keynote Session 7
Room: Main Hall AB

Keynote Speaker: Joshua A. Gordon (National Institute of Mental Health (NIMH)): "Opportunities and Challenges in Computational Psychiatry"

11:30 - 12:15
Industry Showcase
Room: Main Hall AB

Moderators: Julien Penders (Bloomlife); Shuayb Zarar (Microsoft); Louis Atallah (Philips)

12:15 - 13:30
Lunch and EIC Panel
Room: Main Hall AB
Meeting with Editors-in-Chief

Panelists:
Dimitris Fotiadis (EiC, IEEE Journal of Biomedical and Health Informatics)
Xiaochuan Pan (EiC, IEEE Transactions on Biomedical Engineering)
Stephen Wong (EiC, Elsevier Computational Medical Imaging and Graphics)

Moderator: May Wang (Georgia Tech)

Wednesday, May 22

13:30 - 15:00
BHI Special Session #6: Medical Imaging Informatics - Advances and Trends
Room: Meeting Room DE
Chairs: Andreas S. Panayides (University of Cyprus, Cyprus & University of New Mexico, USA), Joel Saltz (Stony Brook University, USA)

13:30
Current Challenges in Medical Imaging Informatics
Costantinos S. Pattichis (University of Cyprus, Cyprus); Andreas S. Panayides (University of Cyprus, Cyprus & University of New Mexico, USA); Amir Amini (University of Louisville, USA); Nenad Filipovic (University of Kragujevac, Serbia); Ashish Sharma (Emory University, USA); Sotirios Tsaftaris (University of Edinburgh, United Kingdom (Great Britain)); Alistair Young (University of Auckland, Cyprus); David J Foran (Rutgers Cancer Institute of New Jersey, USA); Spyretta Golemati (National Kapodistrian University of Athens, Greece); Tahsin Kurc (Stony Brook University, USA); Andrew Laine (Columbia University, USA); Konstantina Nikita (National Technical University of Athens, Greece); Michalis Zervakis (Technical University of Crete, Greece); Joel Saltz (Stony Brook University, USA)

13:45
Pathomic Data and its Significance Beyond a Pathology Report
Joel Saltz (Stony Brook University, USA); Eric B. Durbin (University of Kentucky, USA); Tahsin Kurc (Stony Brook University, USA); David J Foran (195 Little Albany Street & Rutgers Cancer Institute of New Jersey, USA); Ashish Sharma (Emory University, USA); Dimitris Samaras (Stony Brook University, USA)

14:00
Computational Pathology and Integrative Genomics for Cancer Precision Medicine
Kun Huang (Indiana University School of Medicine & Regenstrief Institute, USA)

14:15
Exascale Deep Learning for Medical Image Analysis
Georgia Tourassi (Oak Ridge National Laboratory, USA)

14:30
Can Structural MRI Radiomics Predict DIPG Histone H3 Mutation and Patient Overall Survival at Diagnosis Time?
Jessica Goya-Outi (Inserm/CEA/CNRS/Univ Paris-Sud); Raphael Calmon (APHP, Necker Hospital, France); Fanny Orlhac (INRIA, France); Cathy Philippe (CEA, France); Nathalie Boddaert and Stéphanie Puget (APHP, Necker Hospital, France); Irène Buvat (Inserm/CEA/CNRS/Univ Paris-Sud); Vincent Frouin (CEA, France); Jacques Grill (Gustave-Roussy/CNRS, France); Frédérique Frouin (Inserm/CEA/CNRS/Univ Paris-Sud)

13:30 - 15:00
BHI Session #8: Behavioral & Sensor Informatics
Room: Meeting Room GH
Chairs: Karam Choi (Samsung Advanced Institute of Technology, Samsung Electronics, South Korea, Korea), Soyoung Lee (Samsung Advanced Institute of Technology, Korea), Sung Hyun Nam (Samsung Advanced Institute of Technology, Korea), Terumi Umematsu (Massachusetts Institute of Technology, USA & NEC Corporation, Japan)

13:30
Automatic Subtask Segmentation Approach of the Timed Up and Go Test for Mobility Assessment System Using Wearable Sensors
Chia-Yeh Hsieh, Hsiang-Yun Huang and Kai-Chun Liu (National Yang-Ming University, Taiwan); Kun-Hui Chen (Taichung Veterans General Hospital, Taiwan); Steen J. Hsu (Ming Hsin University of Science and Technology, Taiwan); Chia-Tai Chan (National Yang-Ming University, Taiwan)

13:45
A Deep Learning Assisted Method for Measuring Uncertainty in Activity Recognition with Wearable Sensors
Ali Akbari and Roozbeh Jafari (Texas A&M University, USA)

14:00
Personalized Wellbeing Prediction using Behavioral, Physiological and Weather Data
Han Yu (Rice University, USA); Elizabeth Klerman (Harvard Medical School, Brigham and Women's Hospital, USA); Rosalind Picard (MIT Media Lab, USA); Akane Sano (Rice University, USA)

14:15
Improving Students' Daily Life Stress Forecasting using LSTM Neural Networks
Terumi Umematsu (Massachusetts Institute of Technology, USA & NEC Corporation, Japan); Akane Sano (Rice University, USA); Sara Taylor and Rosalind Picard (MIT Media Lab, USA)

Wednesday, May 22

14:30
Non-Invasive In-Home Sleep Stage Classification Using A Ballistocardiography Bed Sensor
Ruhan Yi and Moein Enayati (University of Missouri, Columbia, USA); James Keller, Mihail Popescu and Marjorie Skubic (University of Missouri, USA)

14:45
Peak Detection Algorithm for Gait Segmentation in Long-Term Monitoring for Stride Time Estimation using Inertial Measurement Sensors
Markus Johannes Lueken (RWTH Aachen University, Germany); Steffen Leonhardt (RWTH Aachen, Germany); Chuong Ngo (RWTH Aachen University & Helmholtz-Institute for Biomedical Engineering, Germany); João Pedro Batista, Jr and Cornelius Bollheimer (RWTH Aachen University Hospital, Germany); Warner ten Kate (Philips Research, The Netherlands)

13:30 - 15:00
BSN Session # 5 - Mental health, Cognitive Load and Wellbeing
Room: Meeting Room F
Chair: Bjoern M Eskofier (Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany), Sunghoon Ivan Lee (University of Massachusetts, USA)

13:30
Assessing the Effects of Stress Response on Glucose Predictions
Mert Sevil, Mudassir Rashid, Iman Hajizadeh, Zacharie Maloney and Sediqeh Samadi (Illinois Institute of Technology, USA); Mohammad Reza Askari (Illinois Institute of Technology, USA); Rachel Brandt and Nicole Hobbs (Illinois Institute of Technology, USA); Minsun Park and Laurie Quinn (University of Illinois at Chicago, USA); Ali Cinar (Illinois Institute of Technology, USA)

13:50
On-Body Monitoring of Voice-Based Cognitive Load Features in an Auditory Working Memory Task
Daryush Mehta, Rohan Deshpande, Luke Letter, Edward Froehlich and Andrew Siegel (MIT Lincoln Laboratory, USA); Thomas Quatieri (MIT, USA); Laura Brattain (MIT Lincoln Laboratory, USA)

14:10
Mobile Biofeedback Therapy for the Treatment of Panic Attacks: A Pilot Feasibility Study
Ryan S McGinnis, Ellen McGinnis, Christopher Petrillo and Matthew Price (University of Vermont, USA)

14:30
WristPress: Hand Gesture Classification with Two-array Wrist-Mounted Pressure Sensors
Bin Liu, Zhiqiang Liu, Jinyang Huang, Rui Sun and Yufei Zhang (University of Science and Technology of China, P.R. China)

15:00 - 15:15
Coffee Break
Room: Main Hall AB

15:15 - 16:45
BHI Special Session #7: Internet of Things and Machine Learning for Health Informatics
Room: Meeting Room DE
Chairs: Nitesh Chawla (University of Notre Dame, USA), Keith Feldman (University of Notre Dame, USA), Teja Kuruganti (Oak Ridge National Laboratory, USA), Ozgur Ozmen (Oak Ridge National Laboratory, USA), Laura Pullum (Oak Ridge National Laboratory, USA)

15:15
Wearable Body Sensor Network
Lei Wang (Chinese Academy of Sciences, P.R. China)

15:30
Data driven connected care solutions for home disease management
Bin Yin (Philips Research China & Fudan University, P.R. China)

15:45
Measuring eating behavior in patients with arm impairment after stroke using a smart plate
Gert Mertes (University of Oxford, United Kingdom (Great Britain) & KU Leuven, Belgium); Li Ding and Wei Chen (Fudan University, P.R. China); Hans Hallez (KU Leuven, Belgium); Jie Jia (Fudan University, P.R. China); Bart Vanrumste (KU Leuven, Belgium)

Wednesday, May 22

16:00
Obstructive Sleep Apnea Classification in a Mixed-Disorder Elderly Male Population Using a Low-Cost Off-Body Movement Sensor
Pradyumna Byappanahalli Suresha and Ayse S Cakmak (Georgia Institute of Technology, USA); Giulia Da Poian (Emory University, USA); Amit J Shah (Rollins School of Public Health, USA); Viola Vaccarino, Donald Bliwise and Gari D Clifford (Emory University, USA)

16:15
Machine Learning Approaches on Gait Biometrics for Securing BSN-based Healthcare Systems
Yingnan Sun (Imperial College London, United Kingdom (Great Britain)); Po Wen Lo (Imperial College London & ICL, United Kingdom (Great Britain)); Benny Lo (Imperial College, United Kingdom (Great Britain))

16:30
Printed flexible and stretchable hybrid electronic systems for wearable applications
Wei Yuan (Suzhou Institute of Nano-Tech and Nano-Bionics, Chinese Academy of Sciences, P.R. China)

15:15 - 16:45
BHI Session #9: Clinical & Public Health Informatics
Room: Meeting Room GH
Chairs: Wei Chen (Fudan University, P.R. China), Benny Lo (Imperial College, United Kingdom (Great Britain))

15:15
Predicting Cognitive Impairment Level after a Serious Game-based Therapy in Chronic Stroke Survivors
Hee-Tae Jung (University of Massachusetts Amherst, USA); Hyunsuk Lee (Woorisoft, Korea); Kwangwook Kim (Daegu University, Korea); Byeongil Kim (Woorisoft, Korea); Sungji Park, Taekyeong Ryu and Yangsoo Kim (Heeyeon Rehabilitation Hospital, Korea); Jean-Francois Daneault (Rutgers University, USA); Sunghoon Ivan Lee (University of Massachusetts, USA)

15:30
Topic modeling to discern irregular order patterns in unlabeled EHRs
Ozgur Ozmen, Hilda Klasky, Olufemi Omitaomu, Mohammed M. Olama, Teja Kuruganti and Laura Pullum (Oak Ridge National Laboratory, USA); Merry Ward, Jean Scott, Angela Laurio and Jonathan Nebeker (Veterans Administration, USA)

15:45
Unpacking Prevalence and Dichotomy in qSOFA Parameters: A Step towards Multi-parameter Intelligent Sepsis Prediction in ICU
Nazmus Sakib (Marquette University); Devansh Saxena and Lin He (Marquette University, USA); Paul Griffin (Purdue University, USA); Sheikh Ahamed (Marquette University, USA); Munirul Haque (Purdue University, USA)

16:00
You're Making Me Depressed: Leveraging Texts from Contact Subsets to Predict Depression
Monica L. Tlachac, Ermal Toto and Elke Rundensteiner (Worcester Polytechnic Institute, USA)

16:15
Estimating Personal Resting Heart Rate from Wearable Biosensor Data
Chentian Jiang (Duke University, USA); Lida Faroqi and Latha Palaniappan (Stanford University, USA); Jessilyn Dunn (Duke University, USA)

16:30
Outside the Hospital Walls: Associations of Value Based Care Metrics and Community Health Factors
Catherine Markley, Keith Feldman and Nitesh Chawla (University of Notre Dame, USA)

15:15 - 16:45
BSN Special Session # 3 - Student Colloquium
Room: Meeting Room F

Expert Panel Chair:
John Rogers (Northwestern University)

Panelists:
Reed Hoyt (USARIEM)
John Lach (U of Virginia)
Jeff Palmer (MIT Lincoln Lab)

Moderator: Carmen Poon (The Chinese University of Hong Kong, Hong Kong)

16:50 - 17:40
Closing Ceremony and Awards Presentation Ceremony
Room: Main Hall AB

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