# 2016 IEEE Wireless Health (WH 2016)

Bethesda, Maryland, USA
25 – 27 October 2016

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# Program in Chronological Order
## (Copyrighted Papers)

## Wednesday, October 25, 2016

| WeAT1:  09:30-10:15 | Main Auditorium |
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**Technical Session 1: Situational and Context Aware Behavioral Monitoring** (Oral Session)
**Chair:**  Conroy, Richard *National Institutes of Health - NIH*

09:45-10:00        WeAT1.2
**Eating Gestures Detection by Tracking Finger Motion** ......................................................................... 1-6
  Fan, Dawei *University of Virginia*; Gong, Jiaqi\* *University of Virginia*; Lach, John *University of Virginia*

10:00-10:15        WeAT1.3
**A Wearable Sensing Framework for Improving Personal and Oral Hygiene for
People with Developmental Disabilities** ............................................................................................... 7-13
  Wijayasingha, Lahiru\* *Imperial College, London*; Lo, Benny *Imperial College London*

| WeBT1:  11:30-12:15 | Main Auditorium |
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**Technical Session 2: The Role of Wireless in Improving Mental Health** (Oral Session)
**Chair:**  Seigel, Galia *National Institutes of Health - NIH*

11:30-11:45        WeBT1.1
**Gaze-Wasserstein: A Quantitative Screening Approach to Autism Spectrum Disorders** ..................................... 14-21
  Cho, Kun Woo *University at Buffalo*; Lin, Feng *University at Buffalo*; Song, Chen *University at Buffalo, The State
  University of New York*; Xu, Xiaowei *Huazhong University of Science and Technology*; Hartley-McAndrew,
  Michelle *SUNY at Buffalo*; Doody, Kathy *Buffalo State University (SUNY)*; Xu, Wenyao\* *SUNY at Buffalo*

11:45-12:00        WeBT1.2
**Detecting Change in Depressive Symptoms from Daily Wellbeing Questions, Personality, and Activity** ......... 22-29
  DeMasi, Orianna\* *UC Berkeley*; Aguilera, Adrian *UC Berkeley*; Recht, Benjamin *Univ. of California Berkeley*

12:00-12:15        WeBT1.3
**Behavior vs. Introspection: Refining Prediction of Clinical Depression via Smartphone Sensing Data** ........... 30-37
  Farhan, Asma Ahmad *University of Connecticut*; Yue, Chaoqun *University of Connecticut*; Morillo, Reynaldo
  *University of Connecticut*; Ware, Shweta *University of Connecticut*; Lu, Jin *University of Connecticut*;
  Bi, Jinbo *University of Connecticut*; Kamath, Jayesh *University of Connecticut*; Russell, Alexander *University
  of Connecticut*; Bamis, Athanasios *Seldera LLC*; Wang, Bing\* *University of Connecticut*

| WeCT1:  14:00-15:00 | Main Auditorium |
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**Technical Session 3: Innovations in Tools for Health Care** (Oral Session)
**Chair:**  Spengler, Sylia *National Science Foundation - NSF*

14:00-14:15        WeCT1.1
**Smart-Energy Group Anomaly based Behavioral Abnormality Detection** ............................................................. 38-45
  Alam, Mohammad Arif Ul\* *University of Maryland Baltimore County*; Roy, Nirmalya *University of Maryland
  Baltimore County*; Petruska, Michelle *University of Maryland Baltimore County*; Zemp, Andrea *University of
  Maryland Baltimore County*

14:15-14:30        WeCT1.2
**MedRem: An Interactive Medication Reminder and Tracking System on Wrist Devices** ..................................... 46-53
  Mondol, Md Abu Sayeed\* *Univ. of Virginia*; Emi, Ifat Afrin *Univ. of Virginia*; Stankovic, John *Univ of Virgnia*

08:30-19:30                                                                                                      WePOS.1
**Using Smart Glasses in Medical Emergency Situations, a Qualitative Pilot Study** ................................................. 54-58
   Schaer, Roger *HES-SO Valais*; Melly, Thomaz *Hopital du Valais*; Müller, Henning *Univ. of Applied Sciences Western Switzerland (HES-SO)*; Widmer, Antoine* *Univ. of Applied Science and Arts Western Switzerland*

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**S3H: A Symptom Surveillance System in High Spatial Resolution using Smartphones** ..................................... 59-64
   Huang, Hui *Michigan Technological University*; Sun, Ye* *Michigan Technological University*

08:30-19:30                                                                                                      WePOS.3
**WalkMore: Promoting Walking with Just-in-Time Context-Aware Prompts** ........................................................... 65-72
   Ding, Xiang* *Department of Computer Science, University of Massachusetts Lowe*; Xu, Jing *Department of Computer Science, University of Massachusetts Lowe*; Wang, Honghao *Department of Computer Science, University of Massachusetts Lowe*; Chen, Guanling *Department of Computer Science, University of Massachusetts Lowe*; Thind, Herpreet *Community Health and Sustainability, University of Massachusetts*; Zhang, Yuan *School of Nursing, University of Massachusetts Lowell*

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**Investigating Postural Sway Features, Normalization and Personlization in**
**Detecting Blood Alcohol Levels of Smartphone Users** ........................................................................................ 73-80
   Aiello, Christina *Worcester Polytechnic Institute*; Agu, Emmanuel* *Worcester Polytechnic Institute*

08:30-19:30                                                                                                      WePOS.5
**Wireless Wearable Photoplethysmography Sensors for Continuous Blood Pressure Monitoring** .................... 81-88
   Zhang, Yiyuan* *Imperial College London*; Berthelot, Melissa *Imperial College London*;
   Lo, Benny *Imperial College London*

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**Is Providing Mobile Interventions "Just-in-Time" Helpful? An Experimental Proof of**
**Concept Study of Just-in-Time Intervention for Stress Management** ........................................................ 89-95
   Smyth, Joshua* *Pennsylvania State University*; Heron, Kristin *Old Dominion University*

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**Implementation of a Platform-Agnostic Working Memory Span Task using Mobile Device Technology** ........ 96-102
   Nelson, Brent *Univ. of Minnesota*; Boroda, Elias* *Univ. of Minnesota*; Lim, Kelvin *Univ. of Minnesota*

08:30-19:30                                                                                                      WePOS.8
**Smartphone Wireless Gyroscope Platform for Machine Learning Classification of Hemiplegic**
**Patellar Tendon Reflex Pair Disparity through a Multilayer Perceptron Neural Network** .................................. 103-108
   LeMoyne, Robert* *Northern Arizona University*; Mastroianni, Timothy *Independent*

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**Wearable Sensor and Algorithm for Automated Measurement of Screen Time** ................................................. 109-116
   Fletcher, Richard Ribon* *Massachusetts Institute of Tech.*; Chamberlain, Daniel *Massachusetts Institute of Tech.*; Richman, Daniel David *Massachusetts Institute of Tech.*; Oreskovic, Nicolas M *Massachusetts General Hospital, Harvard Medical School*; Taveras, Elsie *Massachusetts General Hospital for Children*

08:30-19:30                                                                                                      WePOS.10
**Communication Challenges in a Multi-Sensor Closed-Loop Artificial Pancreas System** ................................ 117-121
   Lazaro, Caterina *Illinois Institute of Tech.*; Oruklu, Erdal *Illinois Institute of Tech.*; Sevil, Mert *Illinois Institute of Tech.*; Turksoy, Kamuran *Illinois Institue of Tech.*; Cinar, Ali* *Illinois Institute of Tech.*

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**RASPRO: Rapid Summarization for Effective Prognosis in Wireless Remote Health Monitoring** .................. 122-127
   Pathinarupothi, Rahul Krishnan* *Amrita Vishwa Vidyapeetham*; Rangan, Ekanath *Amrita Vishwa Vidyapeetham*; Alangot, Bithin *Amrita Vishwa Vidyapeetham University*; Ramesh, Maneesha Vinodini *Amrita Vishwa Vidyapeetham*

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| ThAT1: 10:45-11:45 | Main Auditorium |
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**Technical Session 4: Heart Health in Wireless** (Oral Session)
**Chair:** Iturriaga, Erin *National Institutes of Health - NIH*

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10:45-11:00 ThAT1.1
**AsthmaGuide: An Asthma Monitoring and Advice Ecosystem** ......................................................... 128-135
  Ra, Ho-Kyeong *DGIST*; Salekin, Asif *Univ. of Virginia*; Yoon, Hee Jung *DGIST*; Kim, Jeremy *Univ. of Virginia*;
  Nirjon, Shahriar *Univ. of North Carolina at Chapel Hill*; Stone, David J. *Univ. of Virginia School of Medicine*;
  Kim, Sujeong *Kyungpook National Univ. School of Medicine*; Lee, Jong Myung *Kyungpook National Univ.
  School of Medicine*; Son, Sang Hyuk *DGIST*; Stankovic, John* *Univ. of Virgnia*

11:00-11:15 ThAT1.2
**Battery-Free RFID Heart Rate Monitoring System** ................................................................... 136-142
  Agezo, Sena* *Drexel University*; Zhang, Yuxiang *Drexel University*; Ye, Ziyu *Drexel University*;
  Chopra, Somesh *Drexel University*; Vora, Shrenik *Drexel University*; Kurzweg, Timothy *Drexel University*

11:15-11:30 ThAT1.3
**Towards Data-Driven Pre-Operative Evaluation of Lung Cancer Patients: The Case of Smart Mask** ............ 143-148
  Myers, Brianna* *University of California, Davis*; Atwal, Jaskaran Atwal *University of California Davis*; Yang, Chai
  *University of California, Davis*; Brown, Lisa *University of California, Davis*; Ghiasi, Soheil *University of California,
  Davis*; Knoesen, André *University of California, Davis*

11:30-11:45 ThAT1.4
**Parsing Wireless Electrocardiogram Signals with Context Free Grammar Conditional Random Fields** ....... 149-156
  Nguyen, Thai *Univ. of Massachusetts, Amherst*; Adams, Roy* *Univ. of Massachusetts, Amherst*;
  Natarajan, Annamalai *Univ. of Massachusetts, Amherst*; Marlin, Benjamin *Univ. of Massachusetts, Amherst*

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| ThCT1: 13:30-14:30 | Main Auditorium |
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**Technical Session 5: Enhancing Gait and Movement in Neurological Conditions** (Oral Session)
**Chair:** Rogers, Mary *University of Maryland*

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13:30-13:45 ThCT1.1
**A Portable and Cost-Effective Upper Extremity Rehabilitation System for**
**Individuals with Upper Limb Motor Deficits** ........................................................................ 157-163
  Lin, Feng *University at Buffalo*; Ajay, Jerry *University at Buffalo*; Langan, Jeanne *University at Buffalo*;
  Cavuoto, Lora *University at Buffalo*; Nwogu, Ifeoma *University at Buffalo, SUNY*; Subryan, Heamchand
  *University at Buffalo State University of New York*; Xu, Wenyao* *SUNY at Buffalo*

13:45-14:00 ThCT1.2
**DeepMotion: A Deep Convolutional Neural Network on Inertial Body Sensors for**
**Gait Assessment in Multiple Sclerosis** ............................................................................. 164-171
  Gong, Jiaqi* *University of Virginia*; Lach, John *University of Virginia*

14:00-14:15 ThCT1.3
**Adaptive Symptom Reporting for Mobile Patient-Reported Disability Assessment** ......................................... 172-179
  Engelhard, Matthew* *University of Virginia*; Lach, John *University of Virginia*; Schmidt, Karen *University of
  Virginia*; Goldman, Myla D. *University of Virginia*; Patek, Stephen *University of Virginia*