The Fourth IEEE/ACM Conference on Connected Health: Applications, Systems and Engineering Technologies

Washington, D.C., Sep. 25-27, 2019

ACM/IEEE CHASE 2019 Program

Day 1 (Wednesday, September 25, 2019) – Conference

7:00-8:00	**Breakfast (**Commonwealth Foyer**)**
Room	Richmond/Roanoke
8:00-8:30	**Open Remarks** Chairs: Gang Zhou (William & Mary), Ki Chon (University of Connecticut), Heng Huang (University of Pittsburg), David McManus (University of Massachusetts Medical School)
8:30-9:30	**Keynote Speech 1:** Metric Learning for Health Informatics Keynote Speaker: Aidong Zhang (William Wulf Faculty Fellow and Professor, Computer Science and Biomedical Engineering, University of Virginia; Editor-in-Chief, IEEE/ACM Transactions on Computational Biology and Bioinformatics (TCBB)) Session Chair: Gang Zhou (William & Mary)
9:30-9:45	**Coffee Break** (Commonwealth Foyer)
9:45-12:45	**Conference Session 1**: Cardiopulmonary and activity monitoring using wearable devices Session Chairs: Ki Chon (University of Connecticut), Ye Sun (Michigan Technological University
12:45-13:45	**Lunch (**Williamsburg/Yorktown, Lobby Level**)**
Room	Richmond/Roanoke
13:45-15:15	**Panel:** Optimal Collaboration: Where Engineers and Physicians Can Meet Panelists: 1. Sanket Dhruva, Assistant Professor, School of Medicine, UCSF 2. Allen Hsiao, Associate Professor of Pediatrics (Emergency Medicine) and of Emergency Medicine; Chief Medical Information Officer, Yale School of Medicine & Yale New Haven Health 3. Curtis E. Kennedy, Assistant Professor of Pediatrics, Section of Critical Care Medicine, Baylor College of Medicine 4. Sarah Mougalian, Assistant Professor of Medicine, Department of Medicine, Yale School of Medicine 5. Li-Qun Xu, Chief Scientist at China Mobile Research Institute Moderator: E. Kevin Hall, Assistant Professor of Pediatrics (Cardiology); Director, Pediatric Heart Failure Program, Yale School of Medicine
15:15-15:30	**Coffee Break** (Commonwealth Foyer)
15:30-18:30	**Conference Session 2**: Medical Image analysis using machine learning and visualization Session Chairs: Weisong Shi (Wayne State University), Min-Hyung Choi (University of Colorado Denver)
18:45-20:00	**Dinner Buffet** (Williamsburg/Yorktown, Lobby Level)

Day 2 (Thursday, September 26, 2019) - Conference

7:00-8:00	**Breakfast (**Commonwealth Foyer**)**
Room	Richmond/Roanoke
8:00-9:00	**Keynote Speech 2**: Past, present, and future of computing and health: Perspectives from a ubicomp researcher Keynote Speaker: Gregory Abowd (Regents' Professor and J.Z. Liang Chair, School of Interactive Computing, Georgia Institute of Technology; Editor-in-Chief, Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT)) Session Chair: Gang Zhou (William & Mary)
9:00-9:15	**Coffee Break** (Commonwealth Foyer)
9:15-12:15	**Conference Session 3**: Health management and training systems using wearable devices Session Chairs: James Weimer (University of Pennsylvania, Children's Hospital), Gang Zhou (William & Mary)
12:15-13:15	**Lunch (**Williamsburg/Yorktown, Lobby Level**)**
Room	Richmond/Roanoke
13:15-16:15	**Conference Session 4**: Low-power devices for compliance and behavioral monitoring Session Chairs: Jiaqi Gong (University of Maryland Baltimore County), Kewei Sha (University of Houston)
16:15-16:30	**Coffee Break** (Commonwealth Foyer)
16:30-17:30	**Lightning Talks & Student Travel Awards** Session Chairs: Ye Sun (Michigan Technological University), Hua Fang (University of Massachusetts Dartmouth and Medical School)
Room	**(**Williamsburg/Yorktown, Lobby Level**)**
17:30 – 19:00	**Reception & Demo/Poster Session** Session Chair: Xiaofan (Fred) Jiang (Columbia University)

Day 3 (Friday, September 27, 2019) - Workshops

7:00-8:00	**Breakfast (**Madison Foyer**)**	
8:00-10:00	MCPS Workshop (Washington I)	EdgeDL Workshop (Washington II)
10:00-10:15	**Coffee Break** (Madison Foyer)	
10:15-12:00	MCPS Workshop (Washington I)	SCCH Workshop (Washington II)
12:00-1PM	**Lunch Box (**Madison Foyer**)**	

Conference Session 1: Cardiopulmonary and activity monitoring using wearable devices

1. Paris: Passive and Continuous Fetal Heart Monitoring System
   Yao Yao (University of Maryland Baltimore County, USA); Zeyu Ning, Qingquan Zhang and Ting Zhu (University of Maryland, Baltimore County, USA)
2. A-spiro: Towards Continuous Respiration Monitoring
   Justin A Whitlock (Old Dominion University, USA); Joshua Sill (Eastern Virginia Medical School, USA); Shubham Jain (Old Dominion University, USA)
3. ActiPPG: Using Deep Neural networks for Activity Recognition from Wrist-Worn Photoplethysmography (PPG) sensors
   Mehdi Boukhechba, Lihua Cai, Congyu Wu and Laura E Barnes (University of Virginia, USA)
4. Automated assessment of pulmonary patients using heart rate variability from everyday wearables

Md Juber Rahman (The University of Memphis, USA); Ebrahim Nemati, Md Mahbubur Rahman, Viswam Nathan, Korosh Vatanparvar and Jilong Kuang (Samsung Research America, USA)

5. Development and Feasibility Test of a Capacitive Belt Sensor for Noninvasive Respiration Monitoring in Different Postures
   Dae Gyeom Kim, Changwon Wang and Jong Gab Ho (Soonchunhyang University, Korea); Min Choi (University of Colorado Denver, USA); Se Dong Min and Young Kim (Soonchunhyang University, Korea)
6. Predicting Depressive Symptoms Using Smartphone Data
   Shweta Ware, Chaoqun Yue, Reynaldo Morillo, Jin Lu, Chao Shang and Jinbo Bi (University of Connecticut, USA); Jayesh Kamath (University of Connecticut Health Center, USA); Alexander Russell (University of Connecticut, USA); Athanasios Bamis (Seldera LLC, United States) and Bing Wang (University of Connecticut, USA)

Conference Session 2: Medical Image analysis using machine learning and visualization

1. Multi-task Osteoporosis Pre-screening Using Dental Panoramic Radiographs with Feature Learning
   Sijia Yu, Peng Chu, Jie Yang, Bingyao Huang and Fan Yang (Temple University, USA); Vassilis Megalooikonomou (, Greece); Haibin Ling (Temple University, USA)
2. RadSense: Enabling One Hand and No Hands Interaction for Sterile Manipulation of Medical Images using Doppler Radar
   Elishiah Miller (University of Maryland, Baltimore County, USA); Zheng Li (University of Maryland Baltimore County, USA); Helena Mentis (University of Maryland, Baltimore County, USA); Adrian Park (SAIL Center, Anne Arundel Medical Center, USA); Ting Zhu and Nilanjan Banerjee (University of Maryland, Baltimore County, USA)
3. An Integrated Framework for Using Mobile Sensing to Understand Response to Mobile Interventions among Breast Cancer Patients
   Lihua Cai, Mehdi Boukhechba, Matthew S Gerber, Laura E Barnes, Shayna Showalter, Wendy Cohn and Philip Chow (University of Virginia, USA)
4. Medical Image Learning from A Few/Few Training Samples: Melanoma Segmentation Study
   Golnoush Asaeikheybari (Case Western Reserve University, USA); Justin Green (CWRU, USA); Xiaoye Qian, Haotian Jiang and Ming-Chun Huang (Case Western Reserve University, USA)
5. Smartphone Based Fundus Camera for the Diagnosis of Retinal Diseases
   Mahathir Monjur, Iram Tazim Hoque and Tanzima Hashem (Bangladesh University of Engineering and Technology, Bangladesh); Md. Abdur Rakib (BIRDEM, Bangladesh); Judy Kim (Medical College of Wisconsin, USA); Sheikh Ahamed (Marquette University, USA)
6. Visualization of Emergency Department Clinical Data for Interpretable Patient Phenotyping
   Nathan C Hurley (Texas A&M University, USA); Adrian Haimovich and Richard Taylor (Yale School of Medicine, USA); Bobak Jack Mortazavi (Texas A&M University & Center for Outcomes Research and Evaluation - Yale University, USA)

Conference Session 3: Health management and training systems using wearable devices

1. LiftRight: Quantifying Strength Training Performance using a Wearable Sensor
   Slobodan Milanko and Shubham Jain (Old Dominion University, USA)

2. Intelligent interaction interface for medical emergencies: application to mobile hypoglycemia management
   Catherine Pagiatakis (National Research Council Canada); David Rivest-Henault, David Roy, Francis Thibault and Di Jiang (National Research Council, Canada)
3. A bag-of-words feature engineering approach for assessing health conditions using accelerometer data
   Elham Rastegari (1406 North 120th Plaza, USA); Hesham Ali (University of Nebraska Omaha, USA)
4. GSR-based Distracted Driving Identification using Discrete & Continuous Decomposition and Wavelet Packet Transform
   Omid Dehzangi (West Virginia University, USA); Vaishali Sahu and Vikas Rajendra (University of Michigan Dearborn, USA); Mojtaba Taherisadr (University of Michigan, USA)
5. TracKnee: Knee Angle Measurement Using Stretchable Conductive Fabric Sensors
   Amanda Watson, Minglong Sun, Samhita Pendyal and Gang Zhou (College of William and Mary, USA)
6. BreathCoach: A Smart In-home Breathing Training System with Bio-Feedback via VR Game
   Linlin Tu (Michigan State University, USA); Tian Hao (IBM T. J. Watson Research Center, USA); Chongguang Bi (Michigan State University, USA); Guoliang Xing (The Chinese University of Hong Kong, Hong Kong)

Conference Session 4: Low-power devices for compliance and behavioral monitoring

1. IoT Botnet Detection via Power Consumption Modeling
   Woosub Jung, Hongyang Zhao, Minglong Sun and Gang Zhou (College of William and Mary, USA)
2. A Smart Point-of-care Compliance Monitoring Solution for Brace Treatment of Adolescent Idiopathic Scoliosis Patients
   Omid Dehzangi (West Virginia University, USA); Bhavani Anantapur Bache and Omar Iftikhar (University of Michigan-Dearborn, USA); Jeffrey Wensman and Ying Li (University of Michigan, USA)
3. IAMHAPPY: Towards An IoT Knowledge-Based Cross-Domain Well-Being Recommendation System for Everyday Happiness
   Amelie Gyrard (Wright State University, USA); Amit Sheth (Wright State University & Ohio Center of Excellence on Knowledge-enabled Computing, USA)
4. RestEaZe: Low-power Accurate Sleep Monitoring using a Wearable Multi-sensor Ankle Band
   Stanislav Bobovych (University of Maryland Baltimore County, USA); Fahad Sayeed (Computer Science and Electrical Engineering, USA); Ryan Robucci (University of Maryland Baltimore County, USA); Richard Allen (Johns Hopkins University, USA); Nilanjan Banerjee (University of Maryland, Baltimore County, USA)
5. Wearable sensors and a multisensory music and reminiscence therapies application: To help reduce behavioral and psychological symptoms in person with dementia
   Danish Imtiaz (George Washington University, USA); Yumna Anwar and Arshia A Khan (University of Minnesota Duluth, USA)
6. Understanding the Relationship between Healthcare Processes and in-Hospital Weekend Mortality using MIMIC III

Varun Mandalapu (University of Maryland Baltimore County, USA); Benjamin Ghaemmaghami and Renee Mitchell (University of Virginia, USA); Jiaqi Gong (University of Maryland Baltimore County, USA)

Demo/Poster Session

1. LiftRight: Quantifying Training Performance using a Wearable Sensor
   Slobodan Milanko and Shubham Jain (Old Dominion University, USA)
2. MirrorMatch: Real-Time Detection of Repetitive Movements using Smartphone Camera
   Noah Jennings and Shubham Jain (Old Dominion University, USA)
3. A Machine Learning Approach to Identify High-Cost Elderly Renal Transplant Recipients
   Rui Fu and Peter C. Coyte (University of Toronto, Canada)
4. Know You better: a smart watch based health monitoring system
   Yang Gu (Institute of Computing Technology, Chinese Academy of Sciences, P.R. China); Jianfei Shen (ICT CAS, P.R. China); Yiqiang Chen (Institute of Computing Technology, Chinese Academy of Sciences, P.R. China)
5. Automated Detection of the Onset of Ventricular Depolarization in Challenging Clinical ECG Data
   Christopher I Baek (Sensydia Corporation & University of California Los Angeles, USA); Kanav Saraf (University of California Los Angeles, USA); Michael Wasko (Sensydia Corporation, USA); Xu Zhang (University of California, Los Angeles, USA); Yi Zheng (Sensydia Corporation, USA); Per H Borgstrom (Sensydia Corp, USA); Aman Mahajan (University of Pittsburgh, USA); William Kaiser (University of California, Los Angeles, USA)
6. Investigating Fusion-Based Deep Learning Architectures for Smoking Puff Detection
   Meet P Vadera and Benjamin M Marlin (University of Massachusetts Amherst, USA)
7. A Wearable Diagnostic Assessment System for Attention Deficit Hyperactivity Disorder
   Xinlong Jiang, Teng Zhang, Yunbing Xing, Wuliang Huang, Chenlong Gao and Yiqiang Chen (Institute of Computing Technology, Chinese Academy of Sciences, P.R. China)
8. A Comprehensive Approach for Cough Type Detection
   Ebrahim Nemati, Md Mahbubur Rahman, Viswam Nathan, Korosh Vatanparvar and Jilong Kuang (Samsung Research America, USA)
9. Unobtrusive Sleep Monitoring with Low-Cost Pressure Sensor Array
   Haoyan Liu (University of Arkansas, USA); Alexander Nelson and James Parkerson (University of Arkansas, Fayetteville, USA); Enrique Sanchez (University of Arkansas, USA)
10. Augmented Reality Based Therapy System for Social Skill Deficits
    Kewei Sha (University of Houston - Clear Lake, USA); Zhandong Liu (Baylor College of Medicine, USA); Jack Dempsey (University of Colorado, USA)
11. A Novel and Efficient Approach to Evaluate Biometric Features for User Identification
    Kewei Sha (University of Houston - Clear Lake, USA); Namrata Kayastha (University of Houston-Clear Lake, USA)
12. Analysis of Cyber-Security Vulnerabilities of Interconnected Medical Devices
    Yanchen Xu, Daniel Tran, Yuan Tian, Homa Alemzadeh (University of Virginia, USA)
13. A Decision Support System for Tele-ophthalmology to Improve Eye Health of Wisconsin Population in Community Settings
    Jannatul Ferdause Tumpa and Riddhiman Adib (Marquette University, USA); Dipranjan Das (IPVision Canada Inc., Bangladesh); Sheikh Ahamed (Marquette University, USA); Judy Kim and Velinka Medic (Medical College of Wisconsin, USA); Al Castro and Mirtha Pacheco

(United Community Center, USA); Rebecca Rowland and Jay Romant (City of Milwaukee Health Department, USA)

14. Detecting Kratom Intoxication in Wearable Biosensor Data
    Joshua Rumbut (University of Massachusetts Dartmouth, USA), Hua Fang (University of Massachusetts Medical School & Dartmouth, USA), Stephanie Carreiro (University of Massachusetts Dartmouth, USA), Darshan Singh (Universiti Sains Malaysia, Malaysia), Edward Boyer (Harvard Medical School, USA)
15. Examining cross-validation strategies for predictive modeling of anterior cruciate ligament reinjury
    Dae-young Kim (University of Maryland, Baltimore County, USA); 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)

MCPS Workshop

1. Health Monitoring in Smart Homes Utilizing Internet of Things
   Lauren Linkous, Nasibeh Zohrabi, Sherif Abdelwahed (Virginia Commonwealth University)
2. An Interoperable Open-Source Implementation of the National Early Warning System Algorithm
   David Arney, Yi Zhang, Barbara Dumas and Julian Goldman (Harvard University)
3. [Extended Abstract] A Logic-Based Learning Approach to Explore Diabetes Patient Behaviors
   Josephine Lamp, Simone Silvetti, Marc Breton, Laura Nenzi and Lu Feng (University of Virginia)

EdgeDL Workshop

1. A Key Management Scheme for Establishing an Encryption-based Trusted IoT System
   Quazi Mamun, Muhammad Rana (Charles Sturt University)
2. An Edge-Assisted and Smart System for Real-Time Pain Monitoring
   Emad Kasaeyan Naeini, Sina Shahhosseini, Ajan Subramanian, Tingjue Yin,Amir M. Rahmani, and Nikil Dutt (University of California, Irvine)
3. Fuzzy C-Means Clustering and Sonification of HRV Features
   Debanjan Borthakur (McMaster University), Victoria Grace (Muvik Labs), Paul Batchelor (Muvik Labs), Harishchandra Dubey (UT Dallas), Kunal Mankodiya (University of Rhode Island)

SCCH Workshop

1. eHeart-BP: prototype of the Internet of Things to monitor blood pressure
   Néstor Germán Bolívar Pulgarín (Universidad Nacional de Colombia, Colombia), Denisse Cangrejo (Universidad Nacional de Colombia, Colombia), Octavio Jose Salcedo Parra (Francisco José de Caldas District University of Bogotá, Colombia)
2. Users' Internet Searches as Proxies for Disease Escalation Trends
   Rand Obeidat (Bowie State University, USA), Izzat M Alsmadi (University of Texas A&M San Antonio, USA)