CHASE 2022
The Seventh IEEE/ACM Conference on Connected Health: Applications, Systems and Engineering Technologies
Washington, D.C., November 17-19, 2022

IEEE/ACM CHASE 2022 Conference Program

Day 1 (Thursday, Nov 17, 2022) – Conference

7:30-8:15	**Breakfast**
8:15-8:30	**Open Remarks:** General chairs and TPC chairs Sarah Sun, University of Virginia Paolo Bonato, Harvard Medical School Wenyao Xu, SUNY Buffalo Hassan Ghasemzadeh, Arizona State University
8:30-9:30	**Keynote Speech 1: Toward Assured Autonomous Medical Cyber-Physical Systems** **Keynote Speaker:** Insup Lee, Ph.D. (Cecilia Fitler Moore Professor, Director of PRECISE Center, and Co-Director of Penn Health-Tech, University of Pennsylvania, IEEE Fellow, ACM Fellow) Session Chair: Paolo Bonato, Harvard Medical School
9:30-9:45	**Coffee Break**
9:45-11:00	**Conference Session 1 (75 minutes) - Disease Diagnosis and Prediction I** Session Chair: Amanda Watson, University of Pennsylvania 1. Spatial-Temporal Synchronous Graph Transformer Network (STSGT) for COVID-19 Forecasting Soumyanil Banerjee, Ming Dong, Wayne State University Weisong Shi, University of Delaware 2. Automated Documentation of Almost Identical Movements in the Context of Dementia Diagnostics Sergio Staab, Lukas Bröning, Johannes Luderschmidt, and Ludger Martin, RheinMain University of Applied Sciences 3. BioscoreNet: Traumatic Brain Injury (TBI) Detection using a Multimodal Self-Attention Fusion Neural Network and A Passive Bioscore Monitoring Framework from Smartphone Sensor Data Florina Asani, Srinarayan Srikanthan, Bhoomi Patel, Emmanuel O. Agu, Worcester Polytechnic Institute 4. DeepLOS: Deep Learning for Late-Onset Sepsis Prediction in Preterm Infants Using Heart Rate Variability Zheng Peng, Gabriele Varisco, Rong-Hao Liang, Eindhoven University of Technology, Deedee Kommers, Máxima Medisch Centrum, Ward Cottaar, Eindhoven University of Technology, Peter Andriessen, Carola van Pul, Máxima Medisch Centrum, Xi Long, Eindhoven University of Technology 5. A Machine Learning Study of COVID-19 Serology and Molecular Tests and Predictions Magdalyn E. Elkin, Xingquan Zhu, Florida Atlantic University

*Best paper award candidate

11:00-11:20	**Coffee Break**
11:20-12:35	**Conference Session 2 (75 minutes) - HCI for Healthcare** Session Chair: Sudip Vhaduri, Purdue University 1. Estimating Human Attitude during Robot-mediated Referential Communication Tasks Ziming Liu, Parker Collier, Robort Bray, University of Tennessee, Knoxville, Eun Jin Paek, University of Tennessee Health Science Center, Wenjun Zhou, University of Tennessee, Knoxville, Devin Casenhiser, University of Tennessee Health Science Center, Xiaopeng Zhao, University of Tennessee, Knoxville 2. Adaptation of a Robotic Dialog System for Medication Reminder in Elderly Care* Zhidong Su, Weihua Sheng, Oklahoma State University, Guanci Yang, Guizhou University, Alex Bishop, Oklahoma State University, Barbara Carlson, University of Oklahoma Health Sciences Center 3. Robot-assisted Psycho-education to Enhance Alzheimer's Caregiver Health Fengpei Yuan, Sharon Bowland, Lauren Proctor, Jordis Blackburn, Namrata Mukherjee, Robert Bray, University of Tennessee, Knoxville, Ruth Palan Lopez, MGH Institute of Health Professions, Kristina Wick, University of Tennessee, Chattanooga, Xiaopeng Zhao, University of Tennessee, Knoxville 4. Enhancing Motor Imagery Decoding Via Transfer Learning Olawunmi George, Sarthak Dabas, Abdur Sikder, Marquette University, Roger Smith, University of Wisconsin-Milwaukee, Praveen Madiraju, Nasim Yahyasoltani, Sheikh Iqbal Ahamed, Marquette University 5. A Comprehensive Decoding of Cognitive Load* Xishi Zhu, Soroush Korivand, Nader Jalili, Kittson Hamill, Jiaqi Gong, University of Alabama
12:35-14:00	**Lunch and Break**
14:00-15:00	**Keynote Speech 2: Bioimage Analysis for Answering Questions in Smart Health** **Keynote Speaker: Scott Acton, Ph.D.** (Professor and Chair of Electrical and Computer Engineering, University of Virginia, IEEE Fellow) Session Chair: Sarah Sun, University of Virginia
15:00-16:15	**Conference Session 3 (75 minutes) - Smart Sensing for Novel Health Applications** Session Chair: Zhishan Guo, North Carolina State University 1. Wearable Optical E-Tattoo for Deep Neck Hemodynamic Monitoring Philip Tan, Shreya Tamma, Sarnab Bhattacharya, James Tunnell, Nanshu Lu, University of Texas at Austin 2. Evaluating Melting Gel Coatings for Wearable Metabolic Sensors Anthony Annerino, Ohio State University, Kenneth Narvaez, Lorne Joseph, Lisa C. Klein, Rutgers University, Pelagia-Irene Gouma, Ohio State University

	3. Dual-Mode Chest Wearable E-Tattoo for the Mobile Detection of Cardiac Time Intervals Sarnab Bhattacharya, University of Texas at Austin, Mohmmad Nikbakht, Georgia Institute of Technology, Alec Alden, Karina Ambani, Philip Tan, Taha A Alhalimi, Jieting Wang, University of Texas at Austin, Omer Inan, Georgia Institute of Technology, Nanshu Lu, University of Texas at Austin 4. Fall Detection from Audios with Audio Transformers* Prabhjot Kaur, Wayne State University, Qifan Wang, Meta AI, Weisong Shi, Wayne State University 5. PainRhythms: Machine Learning Prediction of Chronic Pain from Circadian Dysregulation using Actigraph Data - A Preliminary Study Atifa Sarwar, Emmanuel O. Agu, Justin Polcari, Jack Ciroli, Benjamin Nephew, Jean King, Worcester Polytechnic Institute
16:15-16:30	**Coffee Break**
16:30-17:45	**Conference Session 4 (75 minutes) - Disease Diagnosis and Prediction II** Session Chair: Ting Liao, Stevens Institute of Technology 1. Diabetic Retinopathy Prediction Using Progressive Ablation Feature Selection: A Comprehensive Classifier Evaluation Ahmadreza Homayouni, Tieming Liu, Oklahoma State University, Thanh Thieu, Moffitt Cancer Center and Research Institute 2. ICD-BAS: Detecting Ventricular Arrhythmia using Binary Architecture Search for Implantable Cardioverter Defibrillators Qing Lu, University of Notre Dame, Zhenge Jia, Jingtong Hu, University of Pittsburgh, Yiyu Shi, University of Notre Dame 3. Interpreting Acoustic Features for the Assessment of Alzheimer's Disease using ForestNet Paula Andrea Pérez-Toro, Dalia Rodríguez-Salas, Tomás Arias-Vergara, Philipp Klumpp, Friedrich-Alexander-Universität Erlangen-Nürnberg, Maria Schuster, Ludwig-Maximilians University, Elmar Nöth, Juan Rafael Orozco-Arroyave, Andreas K. Maier, Friedrich-Alexander-Universität Erlangen-Nürnberg 4. AutoWean: Extubation Failure Risk Estimation for Critically Ill Patients Jean Park, Amanda Watson, Xiayan Ji, University of Pennsylvania, Kyle C. Quinn, AtlantiCare Regional Medical Centers, Insup Lee, James Weimer, University of Pennsylvania 5. An Explainable COVID-19 Detection System based on Human Sounds Huining Li. SUNY at Buffalo, Xingyu Chen, University of California San Diego, Xiaoye Qian, Huan Chen, Case Western Reserve University, Zhengxiong Li, University of Colorado Denver, Soumyadeep Bhattacharjee, Hanbin Zhang, SUNY at Buffalo, Ming-chun Huang, Duke Kunshan University, Wenyao Xu, SUNY at Buffalo

Day 2 (Friday, November 18, 2022) - Conference

7:30-8:30	**Breakfast**
8:30-9:30	**Keynote Speech 3: Disasters and Wartime Influences Cyber-Healthcare** **Keynote Speaker: Juan Wachs, Ph.D.** (Program Director, National Science Foundation; Professor and Faculty Scholar, Purdue University) Session Chair: Sarah Sun, University of Virginia
9:30-10:00	**Coffee Break**
10:00-11:30	**Conference Session 5 (90 minutes) - Healthcare System Development and Validation** Session Chair: Bobak Mortazavi, Texas A&M University 1. Towards a Telehealth Infrastructure Supported by Machine Learning on Edge/Fog for Parkinson's Movement Screening Shehjar Sadhu, Dhaval Solanki, Nicholas Constant, Vignesh Ravichandran, Gozde Cay, University Of Rhode Island, Manob Jyoti Saikia, Tufts University, Umer Akbar, Brown University, Kunal Mankodiya, University of Rhode Island 2. Closed-looped Sensing and Stimulation System for Parkinson's Disease Early Diagnosis and Rehabilitation* Yi Cai, Xiaoye Qian, Case Western Reserve University, Qin Li, Duke Kunshan University, Lin Feng, Zhejiang University, Ming-Chun Huang, Duke Kunshan University 3. Computational Framework for Sequential Diet Recommendation: Integrating Linear Optimization and Clinical Domain Knowledge* Asiful Arefeen, Arizona State University Niloo Jaribi, Microsoft Corporation Bobak J. Mortazavi, Texas A&M University Hassan Ghasemzadeh, Arizona State University 4. Understanding User Concerns and Choice of App Architectures in Designing Audio-based mHealth Apps* Sudip Vhaduri, Siva Sahitya Simhadri, Purdue University 5. A Data-Driven Validation of Mobile-based Care (mCARE) Project for Children with ASD in LMICs Masud Rabbani, Marquette University, Munirul M. Haque, University of Indianapolis, Dipranjan Das Dipal, Md Ishrak Islam Zarif, Anik Iqbal, Marquette University, Amy Schwichtenberg, Purdue University, Naveen Bansal, Marquette University, Tanjir Rashid Soron, Telepsychiatry Research and Innovation Network Ltd, Syed Ishtiaque Ahmed, University of Toronto, Sheikh Iqbal Ahamed, Marquette University 6. Design and Validation of an Open-Source Closed-Loop Testbed for Artificial Pancreas Systems Xugui Zhou, Maxfield Kouzel, Haotian Ren, Homa Alemzadeh University of Virginia

11:30-12:00	**Break**	
12:00-13:00	**General Lunch**	**Welcome Lunch with NSF-NIH Program Directors**
13:00-15:00	**Poster Rapid Fire:** Poster paper authors will give a 2-minute flash talk for their posters.	**NSF-NIH Aspiring PI Workshop** **Program Directors and Scientists from NIH** Dana Wolff-Hughes, NIH-NCI Fenglou Mao, NIH-Cloud Computing Programs Heather Bowles, NIH-NCI Ceferino Obcemea, NIH-NCI Michele Ferrante, NIH-NIM Yanli Wang, NIH-NLM **Program Directors from NSF** Wendy Nilsen Balakrishnan "Prabha" Prabhakaran Wei Ding Chris Yang Sylvia Spengler Lisa Ulmer
15:00-15:45	**Coffee Break**	
15:45-17:00	**Conference Session 6 (75 minutes)- Sensing and Computation** Session Chair: Bige Unluturk, Michigan State University 1. Post-Lift Analysis of Thermal Imprint for Weight and Effort Detection* Austin Dykeman, Joseph Judge, Priyo Ranjan Kundu Prosun, Gurpreet Kaur, Owen Talmage, Sean Banerjee, Natasha Banerjee, Clarkson University 2. Estimation of Hip, Knee, and Ankle Joint Moment Using a Single IMU Sensor on Foot Via Deep Learning Md Sanzid Bin Hossain, Hwan Choi, Zhishan Guo, University of Central Florida 3. Self-rPPG: Learning the Optical & Physiological Mechanics of Remote Photoplethysmography with Self -Supervision Zahid Hasan, Abu Zaher Md Faridee, Masud Ahmed, Nirmalya Roy, University of Maryland Baltimore County 4. Gait Variability Analysis using Continuous RF Data Streams of Human Activity Sevgi Zubeyde Gurbuz, Emre Kurtoglu, M. Mahbubur Rahman, Dario Martelli, University of Alabama 5. Predicting Weight and Strenuousness from High-Speed Videos of Subjects Attempting Lift Priyo Ranjan Kundu Prosun, Joseph Judge, Owen Talmage, Austin Dykeman, Sean Banerjee, Natasha Kholgade Banerjee, Clarkson University	
17:00-17:30	**Break**	
17:30-19:30	**Award Ceremony, Reception & Demo/Poster Session**	

Day 3 (Saturday, November 19, 2022) Morning: Conference; Afternoon: Workshop

7:30-8:30	**Breakfast**
8:30-9:30	**Keynote Speech 4: Use of Mixed Reality Applications for Healthcare Education, Skills Development, and Telemedicine** **Keynote Speaker: Dr. Mark Cohen (**Dean of the Carle Illinois College of Medicine, Senior Vice President and Chief Academic Officer at Carle Health, University of Illinois Urbana-Champaign**)** Session Chair: Inki Kim, University of Illinois Urbana-Champaign
9:30-9:45	**Coffee Break**
9:45-11:15	**Conference Session 7 (90 minutes) - Health Data Management and Analysis** Session Chair: Oshani Seneviratne, Rensselaer Polytechnic Institute 1. Federated Fuzzy Clustering for Longitudinal Health Data Salvador V Balkus, Hua Fang, Honggang Wang, University of Massachusetts Dartmouth 2. BayesLDM: A Domain-specific Modeling Language for Probabilistic Modeling of Longitudinal Data Karine Tung, University of Massachusetts Amherst, Steven De La Torre, University of Southern California, Mohamed Elmistiri, Arizona State University, Rebecca Braga De Braganca, University of Southern California, Eric Hekler, University of California San Diego, Misha Pavel, Northeastern University, Daniel Rivera, Arizona State University, Pedja Klasnja, University of Michigan, Donna Spruijt-Metz, University of Southern California, Benjamin Marlin, University of Massachusetts Amherst 3. Data Practices of Internet of Medical Things: A Look from Privacy Policy Perspectives Nyteisha Bookert, Weston Bondurant, Mohd Anwar, North Carolina A&T State University 4. A Comparative Study on HIPAA Technical Safeguards Assessment of Android mHealth Applications* Md Raihan Mia, Marquette University, Hossain Shahriar, Maria Valero, Bilash Saha, Md Abdul Barek, Md Jobair Hossain Faruk, Kennesaw State University, Ben Goodman, 4A Security & Compliance, Rumi Ahmed Khan, University of Texas at Austin, Sheikh Iqbal Ahamed, Marquette University 5. Collaboratively Learning Optimal Patient Outcomes Using Smart Contracts in Limited Data Settings Manan Shukla, Jianjing Lin, Oshani Seneviratne, Rensselaer Polytechnic Institute 6. ML Algorithms to Estimate Data Reliability Metric of ECG from Inter-Patient Data for Trustable AI-based Cardiac Monitors Mst Moriom Rojy Momota, Bashir Morshed, Texas Tech University
11:15-11:30	**Conference Closing:** Farewell from the General Chair

1st Interdisciplinary Workshop on XR + AI Integration for Healthcare Applications	
13:00-13:30	**Workshop Opening remarks:** General Chair: Inki Kim, University of Illinois Urbana-Champaign General Co-Chair: Abigail Wooldridge, University of Illinois Urbana-Champaign
13:30-14:30	**Workshop Session 1** 1. An Improved Machine Learning Framework to Assess Extended Reality based Simulators for Healthcare Contexts Avinash Gupta, University of Illinois Urbana-Champaign Harris Nisar, University of Illinois Urbana-Champaign 2. A Edge-computing Framework with AR Applications for Telehealth Ting Liao, Stevens Institute of Technology Ying Wang, Stevens Institute of Technology 3. Systematic Identification of Parameters for the Design of Adaptive Agent in Extended Reality Adam Cross, University of Illinois Urbana-Champaign Bhavin Patel, University of Illinois Urbana-Champaign Inki Kim, University of Illinois Urbana-Champaign
14:30-14:45	**Break**
14:45-15:45	**Workshop Session 2** 1. A Real-Time Analysis of Human Performance in Interactive and Adaptive Mixed Reality Simulation Inki Kim, University of Illinois Urbana-Champaign Mukhilshankar Umashankar, University of Illinois Urbana-Champaign 2. Deep-Learning based Neurocognitive Performance Testing via Object Following in Mixed Reality Ansh Sharma, University of Illinois Urbana-Champaign Keerthana Nallamotu, University of Illinois Urbana-Champaign Mukhilshankar Umashankar, University of Illinois Urbana-Champaign Shenlong Wang, University of Illinois Urbana-Champaign Inki Kim, University of Illinois Urbana-Champaign 3. Use of Mixed Reality Applications for Healthcare Education, Skills Development, and Telemedicine Mark Cohen, University of Illinois Urbana-Champaign Robert Galvez, University of Illinois Urbana-Champaign Inki Kim, University of Illinois Urbana-Champaign Stephen McIver, GigXR Inc.
15:45	**Closing:** Farewell from the General Chair of the 1st Interdisciplinary Workshop on XR + AI Integration for Healthcare Applications