

# MONTHLY TALKS CYBER-PHYSICAL SYSTEMS | 2021 Society of Iran | FALL



Aban. 12 | 8:30 A.M. - 10:30 A.M.  
CPSSI Virtual Hall  
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**SPEAKER:** Amir M. Rahmani, PhD, MBA (University of California Irvine)

## Future Health: Harnessing the Power of Everyday Data, Personal Models, and Health Cybernetic for Health Promotion

**ABSTRACT:** Future Health requires to leverage the fact that each individual is unique due to his/her/their omics (genomic, transcriptomic, metabolomics, etc.), lifestyle, environment, and socioeconomic factors. Progress in sensors, mobile and ubiquitous computing, medical, pharmaceutical and nursing sciences, informatics, genomics, and Artificial Intelligence allows gathering information about individuals to build their own personal models for predictive and preventive guidance. Cybernetics (i.e., continuous closed-loop feedback control) principles can provide perpetual guidance to individuals toward a healthy life in real time. Achieving the goal of preventive health systems in the cybernetic model occurs through the flow of several components. From personalized models, we can predict health status using perpetual sensing and data streams. Given these predictions, we give precise recommendations to best suit the prediction for that individual. To enact these recommendations, we use persuasive technology to deliver and execute targeted interventions. In this talk, I describe how AI and wearable technology are enabling big health data collection, analytics, and smart recommendation. I present examples of how IoT-based remote monitoring and intervention systems are being used to address real-life health and wellbeing issues, and how sense-making is performed on such fine-grained big data.

**BIOGRAPHY OF THE SPEAKER:** Amir M. Rahmani is the founder of Health SciTech Group (healthscitech.org) at the University of California, Irvine (UCI) and the co-founder and Associate Director of the Institute for Future Health (futurehealth.uci.edu), a campus-wide Organized Research Unit (ORU), at UCI. He is an Associate Professor of Nursing, Computer Science, and EECS at UCI and is also a life-time adjunct professor (Docent) in embedded parallel and distributed computing at the Department of Computing of University of Turku (UTU), Turku, Finland. His research is in Internet-of-Things (IoT), e-health, ubiquitous computing, bio-signal processing, health informatics, and big health data analytics. He is especially excited about novel sensing, computation/analytics, communication, and networking paradigms, applied to healthcare/medical and wellbeing applications. He has been leading several NSF, NIH, Academy of Finland, and European Commission funded projects on Smart Pain Assessment, Preventing Preterm-Birth, Family-centered Maternity Care, Stress Management in Adolescents, and Remote Elderly and Family Caregivers Monitoring. He has received numerous research excellence awards (e.g., 2x from Nokia Foundation) and best paper awards. He is the co-author of more than 250 peer-reviewed publications and the associate editor-in-chief of ACM Transactions on Computing for Healthcare.



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