

Healthcare Cyber-Physical System - Pandemic Era Perspectives

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Abstract:

The healthcare system has evolved from traditional healthcare to telemedicine, connected-health (cHealth), electronic health (e-health), mobile-health (mHealth), to smart health (sHealth). The demand for remote healthcare is getting important than ever as evident from the situations in the hospitals during the coronavirus disease (COVID-19) outbreak. Smart healthcare built using Internet-Medical-Things (IoMT) is a key component in smart cities which can provide better and advanced medical facilities to the patients. IoMT, a specific instance of IoT, is a configurable dynamic network of networks, available anywhere, anytime, by anything and anyone. Smart healthcare is further evolving with the help of healthcare Cyber-Physical System (H-CPS) that integrates IoMT, electronic health record (EHR), and machine learning (ML) analytics obtained from sensor data and/or EHR. H-CPS consists of various components including sensors, biosensors, body sensors, electronics, wearables, implantables, networks, EHR, machine learning (ML) analytics, middleware, firmware, and software. This talk will present detailed insight of IoMT based smart healthcare built as a H-CPS. The talk will address many questions about H-CPS based smart healthcare including: (1) What is IoMT or Internet-of-Health-Things (IoHT)? (2) What is Healthcare CPS? (3) What are the critical components of H-CPS? (4) What are the challenges of design and operation of H-CPS? (5) What are the security, privacy issues and their solutions in smart healthcare? (6) What roles H-CPS can play during pandemic?

Speaker Biography:

Dr. Saraju P. Mohanty is a Professor at the University of North Texas. Prof. Mohanty's research is in "Smart Electronic Systems" which has been funded by NSF, SRC, US Air Force, IUSSTF, and Mission Innovation. He has over 20 years of research experience on security and protection of media, hardware, and system. He introduced the Secure Digital Camera (SDC) in 2004 with built-in security features



designed using Hardware-Assisted Security (HAS) or Secure by Design (SbD) principle. He is widely credited as the designer for the first digital watermarking chip in 2004 and first the low-power digital watermarking chip in 2006. He has authored 350 research articles, 4 books, and invented 4 US patents. His Google Scholar h-index is 42 and i10-index is 156 with 7300 citations. He is a recipient of 13 best paper awards, Fulbright Specialist Award in 2020, IEEE Consumer Technology Society Outstanding Service Award in 2020, the IEEE-CS-TCVLSI Distinguished Leadership Award in 2018, and the PROSE Award for Best Textbook in Physical Sciences and Mathematics category in 2016. He has delivered 10 keynotes and served on 11 panels at various International

Conferences. He is currently the Editor-in-Chief (EiC) of the IEEE Consumer Electronics Magazine. He has been serving on the editorial board of several peer-reviewed international journals, including IEEE Transactions on Consumer Electronics and IEEE Transactions on Bigdata. He has been serving on the Board of Governors of the IEEE Consumer Technology Society since 2019, and has served as the Chair of IEEE-CS Technical Committee on VLSI (TCVLSI) during 2014-2018. He is the founding steering committee chair for the IEEE International Symposium on Smart Electronic Systems (iSES), steering committee vice-chair of the IEEE-CS Symposium on VLSI (ISVLSI), and steering committee vice-chair of the OITS International Conference on Information Technology (OCIT).