Healthcare Cyber-Physical System (H-CPS) is More Important than Before

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Abstract:
The healthcare system has evolved from traditional healthcare to telemedicine, connected-health (cHealth), electronics 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 provides many advantages which are called 7Ps including personalized care and participatory care. Smart healthcare is further evolving with the help of healthcare Cyber-Physical System (H-CPS) that integrates IoMT, electronic health record (EHR), and artificial intelligence (AI)/ machine learning (ML) analytics obtained from sensor data and/or EHR. H-CPS consists of various components including sensors, biosensors, 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 IoMT/H-CPS based smart healthcare including: (1) What is IoMT or Internet-of-Health-Things (IoHT)? (2) What is Healthcare H-CPS? (3) What are the critical components of IoMT/H-CPS? (4) What are the challenges of design and operation of IoMT/H-CPS? (5) What is smart healthcare? (6) What are the security, privacy issues and their solutions in smart healthcare? (7) Is edge computing or cloud computing better for smart healthcare? (8) Can H-CPS help in contact tracing 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. His the 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 36 and i10-index is 133 with 5800+ citations. He is a recipient of Fulbright Specialist Award in 2020, 12 best paper awards, IEEE Consumer Electronics Society Outstanding Service Award in 2020 for contributions to the IEEE CE society, the IEEE-CS-TCVLSI Distinguished Leadership Award in 2018, and the 2016 PROSE Award for Best Textbook in Physical Sciences and Mathematics category. He has delivered 9 keynotes and served on 5 panels at various International Conferences. He is 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 (BoG) of the IEEE Consumer Electronics Society and has served as the Chair of Technical Committee on Very Large-Scale Integration (TCVLSI), IEEE-CS during 2014-2018.