Security and Energy Trade-Offs in Consumer Electronics

Saraju P. Mohanty
Department of Computer Science and Engineering
University of North Texas, Denton, TX 76207, USA.
Homepage: http://www.smohanty.org, Email: saraju.mohanty@unt.edu

Abstract:

In the current connected world, security of information as well as that of the consumer electronic (CE) system are equally important. Security is a broad concept that covers many aspects including information security, privacy, trustworthiness, and intellectual property protection. The information security covers the security of data, information, and multimedia which are handled all the time by consumer electronic (CE) systems. The system security may refer to the security of the system (e.g. a specific CE system) that handles the data or information. For example, how trustworthy is the CE system and how much resilient is the system against side channel attacks. Malicious design modifications and hardware Trojans can compromise security or trustworthiness of the system. Side channel attacks rely on analyzing power and timing traces of the security hardware than breaking the encryption algorithm involved. IP protection can be applicable for copyright protection of information (movie, multimedia) or IP protection of the hardware design itself in this global supply chain in the social networking era of Internet. The attacks on the CE systems as well as the security solutions can be either software or hardware based. The software based security solutions that rely on some form of encryption is not full proof as breaking them is just matter of time. The emergence of quantum computing will make things even worse. The talk will present broad perspective of the vast multifaceted forms of security attacks and solutions provided by hardware. Any form of security solutions using software or hardware increases the energy consumption overhead of a CE system. The talk will discuss the security and energy-consumption trade-offs in designing a typical CE system.

Speaker Biography:

Dr. **Saraju P. Mohanty** is a Professor at the Department of Computer Science and Engineering (CSE), University of North Texas (UNT). He obtained a Ph.D. in Computer Engineering from the University of South Florida (USF) in 2003, a Master's degree in Systems Science and Automation (SSA) from the Indian Institute of Science (IISc), Bangalore, India in 1999. Prof. Mohanty was conferred the Glorious India Award in 2017 for his exemplary contributions to the discipline. He was the recipient of 2016 PROSE Award for best Textbook in Physical Sciences & Mathematics from the Association of American Publishers for his Mixed-Signal System book. He received 2016-17 UNT Toulouse Scholars Award for sustained excellent scholarly and teaching achievements. He has received 4 best paper awards. Prof. Mohanty's research is in "Smart Electronic Systems". Prof. Mohanty's research has been funded by National Science Foundation (NSF), Semiconductor Research Corporation (SRC), and USA Air Force. Prof. Mohanty is an author of 250 articles and 3 books, and inventor of 4 granted patents with Google Scholar h-index of 29. He serves as the Editor-in-Chief (EiC) of the IEEE Consumer Electronics Magazine. Prof. Mohanty has been serving on the editorial board of several journals or transactions, including IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD) and ACM Journal on Emerging Technologies in Computing Systems (JETC). Prof. Mohanty serves as the Chair of Technical Committee on Very Large Scale Integration (TCVLSI), IEEE Computer Society (IEEE-CS). He serves on the steering, organizing, and program committees of several international IEEE conferences including ISVLSI, iNIS, and ICCE. Prof. Mohanty is the Conference Chair of ICCE 2018, the flagship Conference of IEEE CE Society, which is co-located with International Consumer Electronics Show (CES). More about his biography, research, education, and outreach activities can be obtained from his website: http://www.smohanty.org.