

### Keynote Speech 3: Exploring the Synergy of 3D Integration and Hardware Security



**Dr. Dofe Jaya**

**Computer Engineering Department, California State University, Fullerton, California, USA**

**Abstract.** As the demand for increased transistor density and performance in integrated circuits (ICs) continues to surge, three-dimensional (3D) integration has emerged as a promising technology. By moving beyond traditional two-dimensional (2D) chips, 3D integration unveils new avenues for computing platforms, including high-performance processors and enhanced computation density. This innovative technology offers advantages such as reduced package size, lower power consumption, improved bandwidth, and enhanced computation density. However, like a double-edged sword, 3D integration also brings unique and unexplored challenges in managing the security of 3D ICs. This keynote address delves into the novel opportunities presented by 3D integration for security mechanisms. It explores how this technology can be leveraged to strengthen hardware security, enabling robust protection against evolving threats. Additionally, it sheds light on the potential security vulnerabilities that may arise in 3D ICs, emphasizing the need for careful consideration and proactive measures to address them.

**Biography.** Dr. Dofe received a Master of Science and Ph.D. in Electrical and Computer Engineering from the University of New Hampshire, New Hampshire, USA, in 2015 and 2018, resp. She is an assistant professor in the computer engineering department at California State University, Fullerton, California, USA. Her research focuses on hardware security, including design obfuscation, side-channel analysis of encryption algorithms, fault attack analysis, and emerging technologies, including 3D hardware security. She is also interested in engineering education research on active learning and equitable pedagogy. Dr. Dofe is guest editor of the Special Issue "3D Technology for Hardware Security: Opportunities and Challenges" of the Electronics journal. She is a technical committee member of IEEE conferences SOCC, ISVLSI, iSES, VDAT, and VDEC. She chaired three panels for women in the engineering forum at the 7th IEEE International Symposium on Smart Electronic Systems. She was a program chair for the Workshop for Women in Hardware and Systems Security (WISE) in 2020 and 2022. She is a reviewer for several prestigious conferences and journals.