



Talk Information

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Title of the talk: A Less-Delay and Wide Conversion-Voltage-Range Level Shifter for Power-Efficiency Health Electronics

Abstract of the talk:

To reduce power consumption, many consumer electronic systems are shifting to lower supply voltage levels. Therefore, to ensure the correct data communication between different modules using different supply voltages, it is necessary to have a level shifter. Especially in some applications, a wide conversion voltage range (CVR) is required. This talk introduces a novel less-delay and CVR level shifter for high power efficiency healthy electronics. The LS consisting of a control signal generator with the switched-capacitor technique (CSG-SC), an internal converting stage (ICS), a latch-up circuit, and an LS core based on the differential cascade voltage switch (DCVS) was implemented by both high-threshold-voltage (HTV) and low-threshold-voltage (LTV) transistors. Switches and capacitors controlled by input-clock signals generated by CSG-SC are used to shift up the voltages (at the top plate) of two capacitors and obtain higher-voltage control signals to turn on HTV transistor switches in ICS. The ICS working with the latch-up circuit obtained the level-shifted output signals, and a fast output clock signal with LS core based on DCVS is generated. The proposed LS has been implemented in a standard 180 nm CMOS process, and simulation results show that it achieves a large CVR from 0.6 to 3 V, with a propagation delay as low as 2.5 ns, and a total average power of 704 nW for a 1 MHz input pulse.

Biography of the speaker:

Quanzhen Duan received a B.S. degree in communication engineering from the Harbin Institute of Technology, Weihai, China, in 2009, and a Ph.D. degree in electronics and communication engineering from Hanyang University, Ansan, Korea, in 2015. Since 2022, she has been an Associate professor with the School of Integrated Circuits, Shenzhen Campus of Sun Yat-sen University, Sun Yat-sen University, Shenzhen, China. From 2015-2022, she was an Associate Professor at the School of Integrated Circuits Science and Engineering, Tianjin University of Technology, Tianjin, China. Her research interests include analog-to-digital converters, bandgap references, low-dropout regulators, and analog-front-end circuits.