SEMINAR ANNOUNCEMENT

DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING
COLLEGE OF DESIGN AND ENGINEERING
Website: https://cde.nus.edu.sg/ece

Area: Integrated Circuits & Embedded Systems (ICES)

Host: Dr Karim Ali Ahmed

TOPIC	:	**Single-Antenna Backscattered BLE5 Transmitter with up to 97m Range, 10.6 µW Peak Power for Purely-Harvested Green Systems**
SPEAKER	:	**Mr Yang Ruiyuan** **Graduate Student, ECE Dept, NUS**
DATE	:	**Monday, 22 April 2024**
TIME	:	**10:00AM-11:00AM**
VENUE	:	**Join Zoom Meeting** **https://nus-sg.zoom.us/j/81824679163?pwd=WkF5SUE1ZGJHeEtyUjNrejFpNmlLZz09** **Meeting ID: 818 2467 9163** **Passcode: 121760**

ABSTRACT

A backscattered BLE5 transmitter for low-cost single-antenna green systems solely powered by mm-scale harvesters. Peak power reduction to 10.6 µW is achieved while enabling BLE-compliant spectral mask up to the maximum allowed backscattered power for range extension. Peak power is reduced via an approximate GFSK modulator architecture based on a non-uniform self-sampling digitally controlled oscillator (DCO) with period pruning/clustering, in place of a power-hungry Gaussian filter and PLL used in conventional GFSK modulators. A 180-nm testchip shows 97-m range with commodity receiver at 4X power and 3X range improvement with respect to prior art.

BIOGRAPHY

Ruiyuan received his B.Eng. (with Honours) in Electrical Engineering from National University of Singapore (NUS) in 2022. Currently, he is pursuing his Ph.D. with the Green IC group at NUS. His recent research focus is on the design of ultra-low-power wireless communication chips based on backscattered communication techniques.

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