

## SEMINAR ANNOUNCEMENT

### DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING

Faculty of Engineering

Website: <https://www.eng.nus.edu.sg/ece/>

**Area: Microwave & Radio Frequency**

**Host: Prof John Ho SY,  
Prof Qiu Chengwei**

|                |   |                                                                                                                                                                                                                                                              |
|----------------|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>TOPIC</b>   | : | <b>Fast Frequency Locked Readout for Wireless Sensors Based on Fano Resonance</b>                                                                                                                                                                            |
| <b>SPEAKER</b> | : | <b>Mr Cui Hongjian<br/>Graduate Student</b>                                                                                                                                                                                                                  |
| <b>DATE</b>    | : | <b>Friday, 25 June 2021</b>                                                                                                                                                                                                                                  |
| <b>TIME</b>    | : | <b>4.00PM to 4.40PM</b>                                                                                                                                                                                                                                      |
| <b>WEBINAR</b> | : | <b>Join Zoom Meeting</b><br><a href="https://nus-sg.zoom.us/j/88543235033?pwd=MVNyNWN5aThDeW03ZE1pQm1MYXBTQT09">https://nus-sg.zoom.us/j/88543235033?pwd=MVNyNWN5aThDeW03ZE1pQm1MYXBTQT09</a><br><b>Meeting ID: 885 4323 5033</b><br><b>Passcode: 594872</b> |

### ABSTRACT

Inductor-capacitor (LC) wireless sensors have been widely studied and applied for health monitoring, as advanced micro-electromechanical systems (MEMS) enable their battery free nature and small size. The changes in LC sensor introduced by bio signals can be wirelessly read by measuring impedance or S parameters using tools such as Vector Network Analyzers (VNA). However, due to the frequency sweeping mechanism in these methods, the readout is not sensor's real-time self-resonance frequencies.

Recently, we observed that the sensor's self-resonance frequencies can be locked to the reader due to Fano resonance, where interference between a continuum band state and discrete state happens. Based on this theory, the LC sensor's self-resonance frequency can be wirelessly read by directly measuring the frequency of current at reader side. In this seminar, we present the mechanism of Fano resonance and show our experiment results.

### BIOGRAPHY

Cui Hongjian received his bachelor's degree in National University of Singapore. He is a current PHD student in Department of Electrical and Computer Engineering. His research interests are in Parity- Time Symmetric systems, and wireless devices in bio- medical applications.

<https://www.eng.nus.edu.sg/ece/highlights/events/>