SEMINAR ANNOUNCEMENT

DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING
Faculty of Engineering
Website: https://www.eng.nus.edu.sg/ece/

Area: Microwave & Radio Frequency

Hosts: Asst Prof John Ho and Assoc Prof Qiu Chengwei

TOPIC	**:**	**Magnet- Free Wireless Actuation Based on Parity-Time Symmetric Circuit**
SPEAKER	**:**	**Mr Cui Hongjian** **Graduate student, ECE Dept, NUS**
DATE	**:**	**29 May 2020, Friday**
TIME	**:**	**4pm to 5pm**
WEBINAR	**:**	**https://nus-sg.zoom.us/j/8056955538** **Meeting ID: 805 695 5538**

ABSTRACT

Wireless actuation is applied in many biomedical devices including implanted sensors where hard- wired power sources are not practical. Traditional wireless actuation systems require magnets to provide force for actuation but suffer bulky size. Circuits based on coupled resonators are alternative choices due to the existence of Lorentz forces. In this seminar, a Parity- Time Symmetric system consisting of a pair of resonators is utilized to realize efficient magnet- free actuation. Our study shows that a small change of self-resonance frequency of either resonator can lead to a current phase change of π because of the property of the Parity- Time Symmetric systems. This actuation scheme can circumvent the limitations associated with the conventional wireless actuation structures and generate maximum Lorentz force with optimal phase distribution at resonance. As demonstration, the experiment shows that our Parity Time- symmetric circuit has the potential for pumping by periodically driving the microfluidic membrane.

BIOGRAPHY

Cui Hongjian received his Bachelor's degree from 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, microfluidic devices, and wireless devices in bio- medical applications.