***SEMINAR ANNOUNCEMENT***

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

***Area: Power and Energy Systems***

***Host: Associate Professor Liang Yung Chii***

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| **TOPIC** | : | **Electrical Capacitance Tomography** |
| **SPEAKER** | : | **Ms. Yue Yuan**<br>**Graduate Student, ECE Dept, NUS** |
| **DATE** | : | **Tuesday, 29 November 2022** |
| **TIME** | : | **3.00PM to 3.30PM** |
| **WEBINAR** | : | **Join Zoom Meeting**<br>**https://nus-sg.zoom.us/j/2965252934?pwd=RER0ck8yV3VhOXhGMG9hSDd1NXhQQT09**<br><br>**Meeting ID: 296 525 2934**<br>**Password: 093369** |

**ABSTRACT**

Electrical capacitance tomography (ECT) is a method to determine the internal dielectric constant distribution of an object by measuring the external capacitance. It is based on the fact that each material tested has a different dielectric constant. When the distribution or concentration distribution of each component changes, the equivalent dielectric constant of the mixed fluid will change, which will change the capacitance between the measuring electrode pairs. On this basis, the corresponding image reconstruction algorithm is used to reconstruct the dielectric distribution of the measured object field. It is a close relative of electrical impedance tomography and is proposed as a method of industrial process monitoring. This seminar designed an 8-plate portable ECT device controlled by a single chip microcomputer. The device is used to measure the specific distribution image. It also uses neural network to optimize the measurement results. This seminar briefly introduces the structure and working principle of ECT system, the positive and negative problems of imaging were studied and three basic image reconstruction algorithms, the hardware of ECT system, including model size design principle and hardware measurement circuit, the software facilities of ECT system, including the selected software types and software process design ideas. COMSOL Multiphysics simulation software was used to model the 8-plate imaging system. It also shows the measurement and optimization results of the system: the classical LBP algorithm, Tikhonov algorithm, and Landweber algorithm are used to obtain the reconstruction results, and the problems in the reconstruction results are analysed.

**BIOGRAPHY**

Ms. Yue received her B.Sc degree in electrical engineering from the Tianjin University in 2019. She is currently an M.Eng student at the Department of Electrical and Computer Engineering, College of Design and Engineering. Her research interest includes the sensor and transducer circuit design, data acquisition and neural networks for the capacitive tomography systems.