SEMINAR ANNOUNCEMENT

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

Area: Microelectronic Technologies and Devices

Host: Prof Armin Gerhard Aberle

TOPIC	**:**	**Versatile Cost-effective Luminescence Imaging of Solar Cells Using Conventional Colour Camera**
SPEAKER	**:**	**Mr Nikhil Papineni** **Graduate Student, ECE Dept, NUS**
DATE	**:**	**Thursday, 30 June 2022**
TIME	**:**	**10.00AM to 11.00AM**
WEBINAR	**:**	**Join Zoom Meeting** **https://nus-sg.zoom.us/j/86297268875?pwd=YMwIwzMqZOrYRbfO-CSg6HPRc8TQea.1** **Meeting ID: 862 9726 8875** **Passcode: 757717**

ABSTRACT

Existing luminescence imaging techniques typically use monochrome cameras to capture spatially resolved intensity information. Spectral information requires spectroscopic measurements, which typically either lacks spatial resolution or requires long measurement durations (minutes or hours) by scanning across the measurement area. Semiconductor materials that emit luminescence in the visible to near-infrared wavelength range, such as perovskites, can be characterised by commercial colour cameras. In this work, an enhanced luminescence imaging setup utilising a modified commercial colour DSLR camera was built and investigated, to simultaneously obtain both wavelength and intensity information in seconds. This can complement existing characterisation techniques. Wavelength estimation was verified by imaging various LED and laser light sources. Photoluminescence and electroluminescence imaging of several perovskite solar cell and thin-film samples was also performed. The technique was found to reasonably estimate wavelengths of narrow-spectrum emission, such as lasers, and is able to show relative changes in wavelengths, spatially and over time, for broader-spectra emission. This cost-effective pseudo-hyperspectral imaging technique is suitable for perovskites which can show time-varying properties due to degradation and ion migration.

BIOGRAPHY

Mr Nikhil PAPINENI is a graduate student at ECE and the Solar Energy Research Institute of Singapore (SERIS) at NUS. He received his B.Sc. Honours degree (Physics with Quantum Technologies specialisation, Minor in Geoscience, Minor in Computer Science) from NUS in 2020.