

SEMINAR ANNOUNCEMENT

DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING
FACULTY OF ENGINEERING

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

Area: Control Intelligent Systems & Robotics, and Power Energy Systems

Host: Assoc Prof Loh Ai Poh

TOPIC	:	Formula-SAE Electric Vehicle Simulation Study
SPEAKER	:	Mr Kang Hean Ming Graduate Student, ECE Dept, NUS
DATE	:	Wednesday, 27 October 2021
TIME	:	4.00PM to 5.00PM
WEBINAR	:	Join Zoom Meeting: https://nus-sg.zoom.us/j/88117491317?pwd=RzdyWIRiOFYzVE95bTY5MINrck1aQT09 Meeting ID: 881 1749 1317 Password: 105607

ABSTRACT

This seminar will be about the development of a simulation model for an electric vehicle for the NUS Formula-SAE team. The simulation model in the PLECS will be used to acquire more knowledge about the electric vehicle and its operations, particularly under race conditions.

The presentation will include details of the pre-charge and discharge circuit, 2-level inverter block, field-orientated control, close-loop control theory, permanent magnet synchronous motor parameters, and a simplified mechanical model, which are used to model the drivetrain of the electric vehicle. The simulation will explore the performance of SIC (silicon carbide) vs IGBT inverter switches during acceleration and constant speed performances. This will help to inform future work involving optimizing switching frequency of inverters, to minimize weight and maximize power density between cooling and passive components.

Recommended background knowledge: electrical drivetrain, inverter, motor controller, control theory, permanent magnet synchronous motor, vehicle mechanical load.

BIOGRAPHY

Graduation Class of 2019 NUS Electrical Engineering (Hons). Pursuing M.Eng Electrical Engineering with the Department of Electrical and Computer Engineering. Research focus: simulation study of electrical drivetrain. Interest in automotive engineering and motorsports.

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