

# Weekly Research Seminar Series

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## Mitigating Flux Drooping in Direct Torque Control Drive

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### Abstract

Due to the uneven voltage vector contribution to the control of stator flux and torque in a direct torque controlled (DTC) induction machine, stator flux magnitude droops at every sector transition, particularly when the machine is running at low speed with heavy load. A simple strategy rotates the conventional DTC sectors according to a square-wave gating signal. The applied voltage vector thereby maintains stator flux magnitude at the transition between sectors and hence improves the phase current, without deterioration in torque response. Simulation analysis of the stator flux drooping problem is presented and both simulation and experimental results confirm the effectiveness of the proposed strategy.

WHEN: Date, (Slot 1 3:30-4:00 PM, Slot 2 4:00-4:30 PM)

WHERE: Room 4.07

## About the Speaker

Dr. Wong read his doctorate degree in induction motor drives and control at Bristol Laboratory for Advanced Dynamic Engineering (BLADE), Bristol University, UK. In his research, Dr. Wong investigated several problems plaguing Direct Torque Control (DTC) induction motor drives and has suggested several methods to mitigate these problems. He also successfully implemented the Minimal Controller Synthesis (MCS), an advanced adaptive control technique first developed in the 90s in the same laboratory, to control the induction motor. He won the Institution of Electrical Engineers UK (IEE) Postgraduate Scholarship in 2000 to aid his research.

Prior to his lecturership in Swinburne Sarawak, Dr. Wong was employed as a Researcher at BLADE. He was involved in the setting up of the Micro Electro-Mechanical Systems (MEMS) Research Team, which pioneered the research and development of a controlled, self-levitating, micro motor in the UK. His team investigates the design, fabrication and control of micro-motor with features from a few microns to a few tenths of a millimetre in size, with target specifications to suit the perceived application of the micro-motor in micro-gyroscope and micro-turbine.