

1. **Title:** Hidden Faults in Induction Motors, Condition Monitoring and Future Trends
2. **Category:** Full Day Tutorial

### 3. Abstract

Induction motors (which consume typically 40 to 50% of all generated electrical energy) are inherently reliable and require minimum maintenance. However due to a combination of environmental, duty and installation related factors, they eventually deteriorate and fail. However, if not detected earlier, a minor “hidden fault” can progressively worsen over time and can cause an unexpected and very costly failure specifically in critical applications. It is also often cheaper and easier to fix faults when they are at the “hidden stage”. Furthermore, hidden faults often affect the symmetry of a machine causing extra losses and heating in the machine, which can reduce its efficiency and increase its running cost.

The aim of the tutorial is to cover various issues that are highly topical and addressed in every section of the industrial world. This tutorial will discuss all possible rotor and stator faults, hidden faults, measurement methods, analysis and detection techniques in induction motors, and will provide specific and practical methods on their use. The participants will gain various skills in this tutorial including understanding real time measurements using dedicated instrumentation and sensor technologies (such as voltage, current, vibration and axial flux) and signal processing techniques. In addition, the participants will have a chance to investigate condition monitoring related case studies using real data. Furthermore, the computer aided real time measurement and analysis techniques utilized in this tutorial will expose the participants to demonstrate to the state of art in condition monitoring of motors as well as the future trends, which finds applications in numerous industrial systems.

### 4. Organizer and presenter

Assoc. Prof. Nesimi Ertugrul  
University of Adelaide  
School of Electrical and Electronic Engineering  
Adelaide, Australia, 5005  
**E'mail:** [nesimi@eleceng.adelaide.edu.au](mailto:nesimi@eleceng.adelaide.edu.au)  
**Phone:** +61 8 8303 5465  
**Fax:** +61 8 8303 4360