SEMINAR

SENSORLESS AND QUASI-SENSORLESS DC AND AC DRIVES FOR ALL OPERATING CONDITIONS   9:00am – 6:00pm

Instructor: Professor P. Vas, Head of Intelligent Motion Control and Condition Monitoring Group University of Aberdeen, Aberdeen, United Kingdom Director of European Sensorless Drives Consortium

ABOUT THE INSTRUCTOR

Professor Vas is well-known authority in the drives field and has contributed to many successful seminars. He is also the author of 5 textbooks in the field by Oxford University Press.

CONTENTS

This seminar will describe the details of speed and position sensorless and artificial-intelligence-based dc and ac drives, including switched reluctance motors. Many practical examples will also be provided. The latest developments in the field will also be discussed and results will be shown for a family of new sensorless drives working at extremely low speed and zero stator frequency as well. These drives are also suitable for automotive applications. In addition to sensorless drives, various new quasi-sensorless drives will also be discussed.

The first part of the seminar will introduce various types of speed and position-sensorless drives: dc, induction, synchronous motor (e.g. permanent magnet drives), switched reluctance motor and the second part will discuss the applications of artificial intelligence to drives.

The topics covered include:

Variable-speed drives

- General, European Sensorless Drives Consortium, space vector theory
- High-performance drives (vector control, direct torque control, direct mean torque control, natural field oriented control, torque controlled drives with reduced flux and torque pulsations)
- Sensorless drives (mathematical-model based and mathematical model-free solutions), a family of sensorless ac drive schemes for very low speed and zero frequency operation
- Quasi-sensorless drives (high-performance drives using SKF sensor bearings)

Review of various computational intelligence techniques

This part describes the fundamentals, simulation and practical aspects of

- Fuzzy logic
- Artificial neural networks
- Fuzzy-neural networks
- Genetic algorithms

Applications of computational intelligence to variable-speed drives

Numerous applications will be described, these include controller, estimator, diagnostic, inverter firing signal generation, torque pulsation reduction techniques, etc. applications for

- Dc drives
- Induction motor drives
- Synchronous motor drives
- Switched reluctance motor drives

Literature Review
Review of existing hardware and software
Future trends

WHO SHOULD ATTEND

Engineers, managers and academics who work in the field of dc and ac drives. No prior knowledge of the artificial-intelligence-based techniques is required.