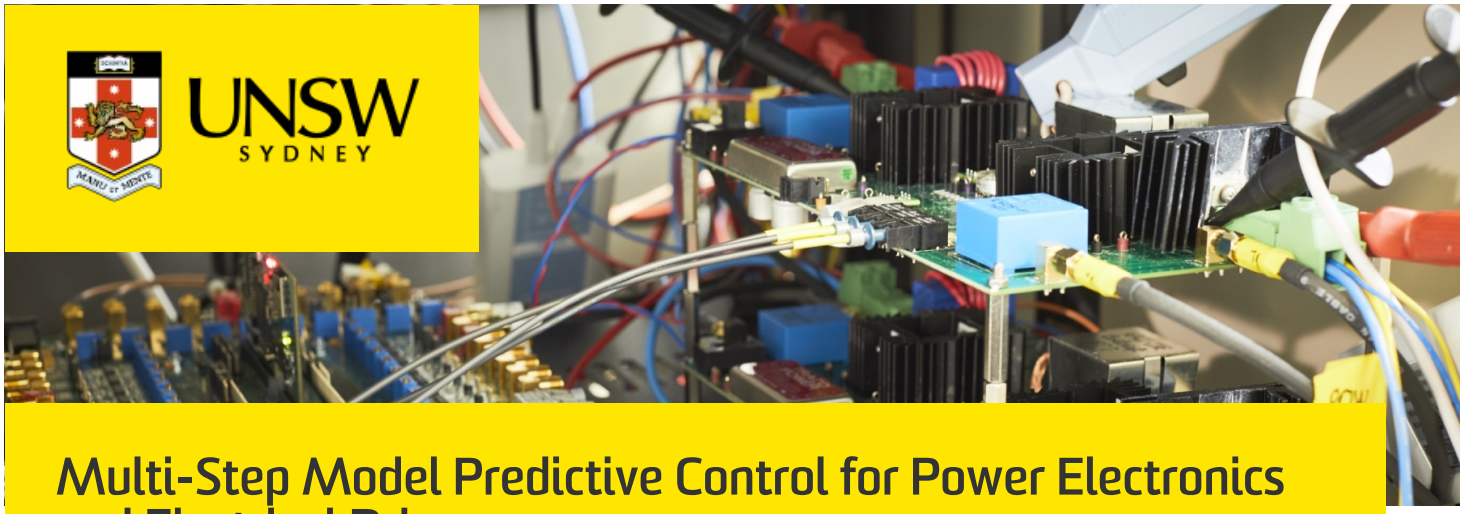

Multi-Step Model Predictive Control for Power Electronics and Electrical Drives

Model predictive control has emerged as a promising alternative control technique for power electronic applications which provides rapid dynamics and responses to demand changes. It can handle multiple variables and system constraints and achieve a fast, dynamic response.

Competitive advantage

- The use of a computationally efficient optimizer, namely sphere decoding algorithm (SDA)
- Experience in the practical application of n-multistep MPC using the 'Sphere Decoding Algorithm' in power electronics systems and electrical drives

Impact

- Demonstrable improvement in electrical machine and drive performance
- Ability to predict future horizon response and control capabilities
- Reduced harmonic distortion and higher efficiency in machine drives and converter systems

Successful applications

- These advanced control techniques have been applied, and shown to be effective in:
- Conventional induction machine drives
- Three-level inverter systems including neutral-point clamped and flying capacitor technologies

Capabilities and facilities

- Rapid prototyping of multistep predictive control techniques
- Multiple testing platforms including machine types and inverter topologies

More Information

Professor John Fletcher

School of Electrical Engineering and Telecommunications

T: +61 (0) 2 9385 6007
E: john.fletcher@unsw.edu.au

UNSW Knowledge Exchange

knowledge.exchange@unsw.edu.au

www.capabilities.unsw.edu.au

+61 (2) 9385 5008