

## 2025 EECMS Summer Internship Application Form

Main Supervisor	Dr Yanyan Yin
Other supervisors (if applicable)	Dr Reza Ryan
Project Title	Secure state and parameter estimation for power systems under cyber-physical attacks
Student location(s) for the project	Curtin Bentley campus
Duration of project	Eight weeks
Project Description	<p>A power system consists of several interconnected machines, controllers, sensors, actuators, and communication networks. Accurate measurement of system states or parameters is crucial for making informed and reliable decisions. These measurements are essential for monitoring system performance, diagnosing issues, and implementing control strategies to ensure efficient and safe operation. However, these systems are increasingly vulnerable to cyber-physical attacks, where malicious activities can disrupt communication and compromise data integrity.</p> <p>The project will undertake a comprehensive analysis of various types of cyber-physical attacks, including data injection, denial of service, and malware infiltration. Understanding the mechanisms and impacts of these attacks is crucial for developing effective countermeasures. This project also aims to explore innovative algorithms and numerically demonstrate the effectiveness of the techniques developed.</p> <p>Expected outcomes:</p> <ul style="list-style-type: none"><li>• Conduct an extensive literature review to understand cyber-physical attacks, power systems, and states or parameter estimation techniques for state space models.</li><li>• Identify the specified problem in terms of state space models.</li><li>• Identify software, algorithms and the simulation environment.</li><li>• Build up the algorithms and implement the simulation with MATLAB.</li></ul> <p>The outcomes will contribute to the advancement of secure power systems against cyber threats.</p>