Dynamic Modelling and Control of Greenhouses

Providing expertise in control and power systems engineering to optimise the efficiency and environmental sustainability of food production in the automated and autonomous greenhouse space for urban agriculture, and its integration with renewable resources.

Competitive advantage

- Nonlinear modelling and analysis of greenhouse dynamics
- Design of linear, nonlinear, and optimal controllers to optimise the greenhouse environment
- The fusion of electrical power engineering and advanced control techniques for the integration of renewable sources to power greenhouses and their environmental control systems
- Holistic integration of the control, communication and power systems that operate greenhouses

Impact

- Novel controller design techniques will optimise the operation of greenhouses and maximise crop yield
- Advanced energy converter and control techniques will facilitate the integration of renewable in greenhouses and widen the implementation of sustainable energy practices

More Information

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Successful applications

- Control technology has been applied to water treatment systems and microgrids in rural and remote communities
- Techniques are being trialed in microgrid applications in rural NSW by distribution network operators

Capabilities and facilities

- Modelling greenhouse dynamics and the analysis and control of nonlinear dynamics in complex systems
- Energy system optimisation and control using nonlinear control for inverter-interfaced microgrids
- A state-of-the-art laboratory microgrid facility that can simulate greenhouse electrical loads and generation
- State-of-the-art real-time digital simulation facilities that allow hardware-in-the-loop testing as well as ultra-fast simulation tasks

Our partners

- Goldwind Environmental
- Tyree Foundation
- Endeavour Energy
- Essential Energy