



# Real-Time Digital Power and Energy System Simulations

**Real-time digital simulation of power and energy systems with sufficient resolution (2-50 $\mu$ s) allows for monitoring, operation, control, testing, optimisation, validation and maintenance of large and complex electricity and energy networks.**

## Competitive advantage

- Having the largest real-time digital-simulation laboratory in Australia and one of the largest in academic and research institutions globally, offers unprecedented simulation capabilities
- Expertise in comprehensive modelling and the real-time digital simulation of power and energy systems
- Expertise in power electronics, combined AC/DC networks and power-systems integration
- Ability to develop digital twins
- Test-bed systems for educational and training purposes

## Impact

- More reliable, secure, stable and efficient networks, integration of transmission and distribution modelling, integration of advanced energy conversion systems such as wind turbines, photovoltaic power plants and energy storage systems.

## Successful applications

- High-voltage DC grids for flexible and efficient electricity transmission
- ElectraNet Heywood Interconnector distance protection relay hardware-in-the-loop testing
- ElectraNet Heywood Interconnector series compensation protection testing
- Simplified 14-generator Australian network test system
- Battery energy-storage system models

## Capabilities and facilities

- 18-rack, 180 CPUs for the RTDS real-time digital simulator
- 1 x OPAL-RT OP5607 real-time digital simulator
- 4 x OPAL-RT OP4500 real-time digital simulators
- 4 x Omicron CMS100 power amplifiers
- Interface with Regatron DC/AC supplies for power hardware-in-the-loop testing

## Our partners

- AEMO
- AEMC

## More Information

Dr Georgios Konstantinou

School of Electrical Engineering and Telecommunications

T: +61 (0) 2 9385 7405

E: [g.konstantinou@unsw.edu.au](mailto:g.konstantinou@unsw.edu.au)

UNSW Knowledge Exchange

[knowledge.exchange@unsw.edu.au](mailto:knowledge.exchange@unsw.edu.au)

[www.capabilities.unsw.edu.au](http://www.capabilities.unsw.edu.au)

+61(2) 9385 5008