Contributions

My main contributions to the project are summarised below:

- Performed a comprehensive literature review of current multi-rotor modelling methods, control techniques and sensor fusion algorithms.
- Derived a model for a hexacopter aircraft based upon Newton-Euler mechanics and implemented the model in Simulink.
- Developed a PID control system for a hexacopter and implemented the system in Simulink.
- Derived a robust control system based on the backstepping technique and implemented this system in Simulink.
- Applied the extended Kalman filter to develop a GPS-reliant sensor fusion algorithm for use both in simulation and with recorded data.
- Developed a second sensor fusion algorithm for use in situations where GPS is either unavailable or unreliable.
- Installed hardware and configured software on a custom hexacopter vehicle with a commercial flight controller.
- Performed test flights to record sensor data to verify the sensor fusion algorithms.

Lachlan Drake

A/Prof. José De Dona