

## Student Internship Opportunities

There is an opportunity to work with/learn from an experienced team of science and engineering professionals on a diverse range of commercial green-fields R&D projects.

### Data Effects

Data Effects is a South Australian technology company that is committed to providing positive social, economic and environmental outcomes for Australian communities. We work closely with government and private industry on a diverse range of technology-focussed agricultural, environmental and peri-urban research and development projects. Data Effects specialises in project management, complex field data acquisition, development and deployment of real-time (IoT) sensing platforms, cloud data management, bespoke data communication/visualisation, machine learning, machine to machine communication and automated systems.

Data Effects provides a friendly, welcoming and dynamic environment to undertake your student internship. We are conveniently located in the heart of Adelaide on level 2, 51 Rundle Mall (opposite H&M).

### Project: Biodiversity - Platypus Monitoring

We are looking for talented and enthusiastic postgraduate students from the following disciplines:

**Electronic Engineering** - Contribute to design and development of a remote area telecommunication and environmental sensor system to monitor native animal habitat and identify the occurrence of feral species. Opportunities include:

- PCB design and layout.
- Design and implementation of a bespoke solar energy management system.
- Adaptation and integration of existing satellite backhaul solutions.
- Design, adaptation and integration of new and existing camera solutions (UV, visible, Infrared and thermal).

**Software Engineering, Computer Science and Artificial Intelligence** - Contribute to the design and deployment of an existing Data Effects cloud-based IoT data management, visualisation and Artificial Intelligence (AI) platform. Opportunities include:

- Modern tech stack and tools including C#.Net, Python, VueJS, PostgreSQL OpenAPI 3.
- Development of server-side algorithms for image / data management with Web-based visualisation
- Exposure to cloud environments such as AWS, Azure and/or GCP.
- Embedded / firmware development working with electronic engineers on bespoke IoT hardware components.
- Database design and implementation.
- Development of secure/access restricted login systems.

Commercial and Industrial Design - Contribute to the industrial design of a field-deployable, remote area telecommunication and environmental monitoring hub. Opportunities include:

- Product prototyping (3D printing and CAD).
- Design practical technology hardware solutions for field deployment in remote locations (style, function, quality and safety).
- Work in collaboration with fabrication and design partners (e.g. [Rowland Metalworks](#)) to facilitate the manufacturer of commercial products.

## Project Summary

Extension and adaption of an existing Data Effects cloud-based IoT data management, visualisation and AI platform. Design, development and provision of a remote area telecommunication and environmental sensor system to:

- Monitor platypus habitat in the Flinders Chase National Park on Kangaroo Island.
- Monitor rakali (native water-rat) habitat in Cox Creek in the Adelaide Hills.
- Monitor and identify feral animal (cats and pigs) in areas of native vegetation throughout South Australia.

The environmental sensor system will enable:

- Collection and transfer of still photographs and videos within 50 - 100 m of the central hub (within Wi-Fi range).
- Collection and transfer of small, discrete data packets (i.e. water temperature, water level and dissolved oxygen) from sites within 2 - 5 km (depending on topography and vegetation) of the central hub.

The central satellite-enabled communication hub will comprise a:

- Standalone solar power generation and management system.
- Satellite backhaul link.
- Local Wi-Fi network.
- Low Power Wide Area Network (LPWAN) gateway.

IoT sensors will include:

- PT100 temperature sensors.
- Ultrasonic level sensors.
- Dissolved oxygen sensors .
- pH sensors.
- ORP sensors.
- EC sensors.
- Turbidity sensors.

The IoT data management, visualisation and AI platform will include:

- Further development of timeseries and geospatial database solutions.
- Geospatial, parameter and time based search functionality.
- Development of a secure/access restricted login system.