

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: Agriculture - Endemic Disease Management

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

Software Engineering, Computer Science and Artificial Intelligence - Contribute to the design and development of a cloud-based data management and Artificial Intelligence (AI) platform to securely store and automatically interrogate and classify images of plant disease that impact vineyards and market gardens. 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.
- Android and iOS mobile app development.
- Exposure to cloud environments such as AWS, Azure and/or GCP.
- Embedded / firmware development working with electronic engineers on bespoke IoT hardware components.
- Exposure to a range of telecommunication backhaul technologies.

Project summary

Disease prediction using real-time, in-crop condition monitoring, field data collection apps and Artificial Intelligence

Develop a cloud-based data management and Artificial Intelligence (AI) platform to securely store and automatically interrogate and classify images of plant disease that impact vineyards and market gardens (Botrytis, Downy Mildew, Sclerotinia & Powdery Mildew). Initial AI training will be carried out using reference images. Ongoing AI training will be achieved using images of disease occurrence collected by field operatives at the Tiers Vineyard and Cobble Dick Market Gardens.

To facilitate data collection for AI training, we will develop an intuitive mobile interface to enable both experienced and inexperienced operatives to efficiently collect georeferenced and time-stamped field observations (including images) related to disease occurrence in vines and vegetable crops. All observations and images will be stored securely in the cloud-based data management and AI platform for validation by disease pathology experts from SARDI (on mobile phone or computer). Initially, all disease images collected during the project will be assigned disease ratings by field operatives, expert disease pathologists and the AI. This will allow ongoing AI training and review that will enable model refinement that will be pushed to the mobile application for automated disease-risk classification, reducing the need for manual examination by plant disease experts.

In addition to field observations, we will utilise a range of telecommunication technologies (LPWAN, Satellite, NB-IoT, Cat-M1) to monitor atmospheric and edaphic parameters throughout the Tiers Vineyard and Cobble Dick Market Gardens. In-canopy parameters will include temperature, humidity and leaf wetness. Beyond the canopy, vineyard/farm-scale parameters will include near-surface soil moisture and localised rainfall that will be used to better understand the broader environment. These environmental data will be used to compare local conditions with established disease alert warning parameters (e.g. BOM Downy Mildew Advice).

Real-time sensed environmental parameters will be automatically married to validated, georeferenced/time-stamped AI-generated disease occurrence observations. These combined data sets will enable a secondary AI training process and provide a powerful machine learning tool to aid in the development of on-farm and region-specific disease alerts. These alert triggers (push notifications) will help growers make more informed disease management decisions and will improve over time as more real-time sensed data and AI validated field observations are collected to help refine disease risk models.

This AI scoping initiative will provide a powerful tool that is translatable to improve disease risk management across all regions and agricultural sectors.