COWS & CODE

THE INTENSIVE SCHOOL IN SENSORS AND DATA ANALYTICS FOR LIVESTOCK RESEARCHERS

10th -14th August 2026 – OSU, Stillwater, Oklahoma

Are you an animal scientist using sensor technologies in your research program and struggling to get the most out of all these emerging technologies?

There is a great opportunity for you to fast track your skill development in this area!

Oklahoma State University and CQUniversity Australia are partnering to deliver a week-long, hands-on course in Stillwater Oklahoma designed to train graduate students and early career faculty in the application of on-animal sensors for livestock research. This programme, which represents the most comprehensive training opportunity developed to date, aims to help researchers jump-start their use of these technologies in a research context.

Some of the topics areas and opportunities to be covered include...

- Research grade hardware development (GPS, accelerometers, collars and ear tags etc);
- Sensor deployment and evaluation (hands on practical: deploying collars, ear tags and leg tags);
- Basic to advanced sensor data analysis including metric development, behavioural algorithm analysis using machine learning and spatial modelling;
- Sensor data fusion (integrating data from multiple platforms);
- Statistical analysis of sensors derived data for empirical research (i.e. control/treatment studies);
- Experimental design for sensor-based research projects; and
- Opportunities for one-on-one tutoring and advice throughout the week.

To register your interest for an application package (applications will open in March) jump to this link www.tinyurl.com/cowsandcode or scan the QR code...

What will you get out of it?

The intensive school is structured to provide a comprehensive overview of on-animal sensor technology and data analysis, covering several key areas:

Hands-on hardware skills: Participants will engage in "Cowboy engineering", learning how to physically build and program sensors, including the assembly of research grade accelerometer ear tags and GPS tracking collars. They will get exposure to a range of commercial on-animal sensor systems and develop an understanding of the benefits and limitations of these systems.

Sensor deployment and evaluation: The agenda includes a practicum for sensor deployment on animals, with hands on training in the fitment of collars, leg tags and ear tag sensors and the evaluation of potential impacts of these systems on behaviour and welfare.

Behavioural observation and sensor data collection: Participants will learn how to undertake field observations of animals to enable creation of annotated data sets to facilitate the development of behavioural models.

Sensor Data Analysis: Training covers the download and management of accelerometer and similar data, algorithm development (ranging from simple metric development to complex behavioural modelling), and the assessment of algorithm accuracy and precision. Students will learn to use a range of machine learning and AI techniques through the freely available R platform.

Spatial Data Analysis Modelling: The curriculum includes cleaning and analysing location data from GPS, along with basic and complex spatial data analysis for behavioural modelling and livestock-landscape interaction evaluation.

Sensor fusion, advanced animal behaviour modelling and comparative analysis: Specialists in the field of data fusion will provide participants with training in the integration of multiple sensors to develop advanced behavioural models and multi-layer spatial analysis. Training will be provided in the analysis of sensor data for comparison of empirical (e.g. traditional control and treatment experiments), and observational (e.g. resource selection function analysis) studies.

CQUniversity AUSTRALIA

OSU

COWS & CODE

Experimental Design: Experts will guide students through the complexities of experimental units, valid comparisons, and identifying flaws in collected data to enable the development of robust experimental designs. Participants will get one-on-one access to expert review of their current and future research projects.

Networking with key researchers: The course provides a unique opportunity to develop professional connections with leading researchers and other students and faculty working in this rapidly developing field of animal science.

Who are the instructors?

The course is being delivered by a dedicated team of globally recognised experts in their respective fields. As well as a number of guest lecturers providing the latest information on specialist topics, this team of educators will be working with you for the entire five day training period to provide the best learning experience possible!

Professor Ryan Reuter (Oklahoma State University) is a globally recognised leader in the development, testing and evaluation of precision technologies with a focus on virtual fencing and sensor data analysis.
https://scholar.google.com/citations?user=40ka8j8AAAAJ&hl=en&oi=ao

Emeritus Professor Derek Bailey (New Mexico State University and Deep Well Ranch Arizona) has over 30 years of experience in the application of sensor systems for collection of livestock data with a wide range of experience in sensor development, deployment, data analysis and sensor based experimental design -
https://scholar.google.com/citations?user=Cv_JJjIAAAAJ&hl=en&oi=ao

Professor Mark Trotter (CQUniversity Australia) leads the Precision Livestock Management Research Group at CQU. Mark has been developing research grade sensors systems for over 20 years and is recognised as a leader in sensor-based project concept development.
https://scholar.google.com/citations?user=IqQdItEAAAAJ&hl=en&oi=ao

Dr Anita Chang (CQUniversity Australia) is a recognised leader in the field of on-animal sensor data analysis having developed numerous machine learning based approaches to model animal behaviour. She has specialised skills in sensor data fusion and simulated real-time data analysis. https://scholar.google.com/citations?user=iMKfJSoAAAAJ&hl=en

Assistant Professor Jamie Brennan (South Dakota State University) is recognised as a leader in the field of precision livestock technologies with expertise in GPS data analysis. https://scholar.google.com/citations?user=Hq0i6IUAAAAJ&hl=en&oi=ao

Dr Thomas Williams (CQUniversity Australia) specialises in developing, evaluating, and implementing sensor systems in the extensive beef industry. He has experience with a range of commercial and research sensor systems and skills in accelerometer and GPS data analysis. https://scholar.google.com/citations?user=d79Am_4AAAAJ&hl=en

Course Details

When: 10th to the 14th of August 2026

Where: Oklahoma State University, Stillwater Campus

Cost: Course registration fees: Graduate Student US$950, Faculty US$1,950. Accommodation will be available at an extra cost and travel is under your own steam.

Registration: Numbers are limited, and participants are selected based on merit of application. Application forms will be sent out in March.

How to apply: Register your initial interest and receive an application pack through this web page www.tinyurl.com/cowsandcode.

Prerequisites and assumed knowledge: Participants are expected to be enrolled as a graduate research student or hold a faculty position in the field of animal science, precision livestock management or ICT as related to animal production and need to be actively involved in research. Basic knowledge of livestock production systems and animal handling skills are expected. Basic data analysis knowledge and skills in the R statistical package are required.

Enquiries or further information : Reach out to Professor Ryan Reuter ryan.reuter@okstate.edu or Professor Mark Trotter m.trotter@cqu.edu.au