STEM Community Partnerships Program

Camden local scenario

Technology

At Future Dairy, near Camden, robots are being used to milk cows. They are also being used to herd cattle, identify sick and injured animals, and check they have enough quality pasture to graze on. From agriculture to finance, to communication to security, our use of technology is always evolving. How will our continued immersion with technology and reliance on the digital world affect our direction?

CSIRO are helping Roads and Maritime Services NSW (RMS) by implementing a monitoring system using 2400 sensors to collect information on the condition of the road, and using machine-learning based predictive analytics, are able to continuously assess the data collected and provide an early warning of problems before users are affected. Through the continuous monitoring, RMS can undertake condition-based and predictive-based maintenance to reduce costs and minimise interruptions to traffic on the Sydney Harbour Bridge.

Technology can be defined as a novel process, system or device for performing a task more efficiently and effectively than via existing approaches. Machine intelligence is a prediction technology. Machines don't just do things that we've told them to do better and faster, but they are coming up with new ways of doing things that we wouldn't have thought of. Drones can monitor water levels in farm damns and robots can be programmed to do tasks that are too dangerous for humans, while the Internet of Things (IoT) connects any device with an "on and off switch" to the Internet. These technologies not only have the potential to impact how we live but also how we work.

How your Council tackles the complexity of this issue will impact you now and future generations.

Your task

Your task is to use the information above and resources provided below as a start to identify a local problem and design a STEM-focussed solution.

(Question, Design, Explore, Communicate)

The Shrimp robot at Future Dairy near Camden.
[Photo courtesy of ACFR]

Resources

CSIRO research

- CSIRO Data61 Research: https://research.csiro.au/data61/structural-health-monitoring/
- Cybertongue to transform milk market and help lactose sufferers: https://www.csiro.au/en/News/News-releases/2018/Cybertongue-to-transform-milk-market-and-help-lactose-sufferers
- Fitness tracker for cows to help Aussie farmers: https://www.csiro.au/en/News/News-releases/2018/Fitness-tracker-for-cows-to-help-Aussie-farmers
- Our Robotics Innovation Centre has been officially launched: https://research.csiro.au/robotics/our-robotics-innovation-centre-launched/
- Autonomous and Robotic Systems Research: https://research.csiro.au/robotics/our-work/research-areas/
- CSIRO blog article: https://blog.csiro.au/what-if-intelligent-machines-could-learn-from-each-other/
- CSIRO blog article: https://blog.csiro.au/digital-agriculture-whats-all-the-fuss-about/

Reports

- Future Dairy: http://futuredairy.com.au
- Australian Centre for Field Robotics website: https://sydney.edu.au/engineering/our-research/robotics-and-intelligent-systems/australian-centre-for-field-robotics.html
- Hajkowicz, Stefan 2015, *Global megatrends: seven patterns of change shaping our future*, CSIRO Publishing, Victoria, Australia

Articles

ABC Four Corners | Future Proof: http://www.abc.net.au/4corners/stories/2016/07/04/4491818.htm

- **Digital disruption could threaten 40 per cent of jobs, says Productivity Commission:**

  http://www.abc.net.au/news/2016-06-15/digital-disruption-could-threaten-40pc-of-jobs/7512778
- **Forbes article, When Your Colleague Is A Robot: How 5G Will Connect Humans And Machines In Tomorrow's Factories:**

  http://www.forbes.com/sites/huawei/2016/06/14/when-your-colleague-is-a-robot-how-5g-will-connect-humans-and-machines-in-tomorrows-factories/

  Wired article, The Internet of Things Is Far Bigger than Anyone Realizes: https://www.wired.com/insights/2014/11/the-internet-of-things-bigger/
- Forbes article, A Simple Explanation Of 'The Internet of Things:

  http://www.forbes.com/sites/jacobmorgan/2014/05/13/simple-explanation-internet-things-that-anyone-can-understand/#2a47f2726828

  Technology Review article, Our Fear of Artificial Intelligence: https://www.technologyreview.com/s/534871/our-fear-of-artificial-intelligence/
- SBS article, Robot ranchers monitor animals on giant Australian farms:

  https://www.sbs.com.au/topics/science/future/article/2016/05/24/robot-ranchers-monitor-animals-giant-australian-farms