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| USQ_Ver_2_BW | University of Southern Queensland |
| **Higher Degree Research**  **Thesis Topics for Prospective Postgraduate Students** |

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| **Thesis Topic Title** | Self-learning technology for irrigation and fertiliser management |
| **Thesis Description/ Information**  *(approx 150 words)* | Water savings in the Australia's irrigated agricultural industries can be achieved through irrigation control systems that automatically and optimally adapt to the crop water requirements from real-time sensor data. A common approach for irrigation is from crop stress and soil-water status measurements. Model-based control strategies enable irrigation and crop optimisation using a calibrated crop production model to predict which irrigation application and timing maximises productivity. This project will investigate control strategies and/or crop production models for optimisation of irrigation application. The model used may be industry developed black-box models; alternatively, deep learning may be used for training and predicting crop dynamics based on infield data. |
| **Thesis Topic Keywords** | Automation, machine vision, irrigation control system |
| **Principal**  **Supervisor** | |  |  |  |  |  | | --- | --- | --- | --- | --- | | Title: | Dr |  | Faculty: | Health, Engineering and Sciences | | First Name: | Alison |  | School: | Agricultural, Computational and Environmental Sciences | | Surname: | McCarthy |  | Institute: | Institute for Agriculture and the Environment | | Staff ID: | 103289 |  | Centre: | National Centre for Engineering in Agriculture | | Phone No: | 46312189 |  | College: | Click to Select from Drop Down Menu | | Email: | mccarthy@usq.edu.au |  | Notes: | Click here to enter text. | | Tick this box if Registered  USQ Supervisor |  |  |  |  | |
| **Associate Supervisor** | |  |  |  |  |  | | --- | --- | --- | --- | --- | | Title: | Dr |  | Faculty: | Health, Engineering and Sciences | | First Name: | Malcolm |  | School: | Agricultural, Computational and Environmental Sciences | | Surname: | Gillies |  | Institute: | Institute for Agriculture and the Environment | | Staff ID: | 102440 |  | Centre: | National Centre for Engineering in Agriculture | | Phone No: | 46311715 |  | College: | Click to Select from Drop Down Menu | | Email: | Malcolm.gillies@usq.edu.au |  | Notes: | Click here to enter text. | | Tick this box if Registered  USQ Supervisor |  |  |  |  | |
| **Associate Supervisor** | |  |  |  |  |  | | --- | --- | --- | --- | --- | | Title: | Click to Select from Drop Down Menu |  | Faculty: | Click to Select from Drop Down Menu | | First Name: | Click here to enter text. |  | School: | Click to Select from Drop Down Menu | | Surname: | Click here to enter text. |  | Institute: | Click to Select from Drop Down Menu | | Staff ID: | Click here to enter text. |  | Centre: | Click to Select from Drop Down Menu | | Phone No: | Click here to enter text. |  | College: | Click to Select from Drop Down Menu | | Email: | Click here to enter text. |  | Notes: | Click here to enter text. | | Tick this box if Registered  USQ Supervisor |  |  |  |  | |
| **Thesis Topic Approval** | I confirm that my involvement in this research topic has received  ‘in principal’ approval from my line manager/project leader. |
| **Open Date** | 29/02/2016 |
| **Close Date** | 31/12/2016 |
| **Review Date** *(Default 6 months)* | 26/08/2016 |
| **Field of Research\***  **(as relates to Thesis Topic)** | *Please enter your* 4 digit *FoR Code.*  Please click this link to obtain your 4 digit \* [Field of Research (FoR) code](http://www.abs.gov.au/AUSSTATS/abs@.nsf/Latestproducts/6BB427AB9696C225CA2574180004463E)   |  |  |  |  | | --- | --- | --- | --- | | ***0*** | ***7*** | ***0*** | ***1*** |  |  |  |  |  | | --- | --- | --- | --- | | ***0*** | ***7*** | ***0*** | ***3*** |  |  |  |  |  | | --- | --- | --- | --- | | ***0*** | ***9*** | ***0*** | ***6*** |   *Maximum 3 entries in total to be indicated* |
| **Research Affiliations**  *(Please indicate ALL relevant affiliations)* | Faculty of Business, Education, Law & Arts  Faculty of Health, Engineering and Sciences  Arts and Communication  Agricultural, Computational and Environmental Sciences  Commerce  Civil Engineering and Surveying  Law and Justice  Nursing and Midwifery  Linguistics, Adult and Special Education  Mechanical & Electrical Engineering  Management & Enterprise  Psychology & Counselling  Teacher Education and Early Childhood  Health & Wellbeing  Open Access College (OAC)  College for Indigenous Studies, Education and Research (CISER)  Australian Digital Futures Institute (ADFI)  Institute for Agriculture and the Environment (IAgE)  Institute for Resilient Regions (IRR)  Australian Centre for Sustainable Business & Dev (ACSBD)  Centre for Crop Health (CCH)  Centre for Excellence in Engineered Fibre Composites (CEEFC)  Centre for Health Sciences Research (CHSR)  Computational Engineering and Science Research Centre (CESRC)  International Centre for Applied Climate Sci (ICACS)  National Centre for Engineering in Agriculture (NCEA) |
| **Academic Program**  *(Please indicate ALL relevant programs)* | Doctor of Philosophy (DPHD)  Doctor of Applied Science (DASC)  Doctor of Business Administration (DBAR)  Doctor of Creative Arts (DCAR)  Doctor of Education (DEDU)  Doctor of Professional Studies (DPRS)  Doctor of Professional Engineering (DPEN)  Master of Engineering (Research (MENR)  Master of Business Research (MBSR)  Master of Laws (Research) (LLMR)  Master of Science Research (MSCR)  Master of Psychology/PhD (Clinical Psychology) MPHD |
| **Scholarship Funding Available** | Yes  No  **Details**: Australian Postgraduate Award  **URL**: http://www.usq.edu.au/scholarships/usq/australian-postgraduate-award, https://www.usq.edu.au/research/research-at-usq/institutes-centres/ncea/apa-scholarships |
| **Ethics Approval Number/s (if pre-approved)**  **USQ and/or external party** | Yes  No  Not Applicable  **Details**: **Click here to enter text.** |
| **Expectations, Additional Requirements, if any** | **Click here to enter text.** |
| **Project ID** | *For Office Use Only* |