

Dr Cheryl McCarthy

- Qualifications:**
- PhD, University of Southern Queensland (USQ) (2009) 'Automatic non-destructive dimensional measurement of cotton plants in real-time by machine vision'
 - BEng (Mechatronics) (1st Class Honours) USQ (2005) - awarded University Medal
 - UAV Operator's Certificate (CASA.UOC.0379) and UAV Controller's Certificate (ARN 826594) for multi rotor and fixed wing UAVs below 7 kg

Current institution: National Centre for Engineering in Agriculture (NCEA) at USQ

Current position title: Research fellow - Mechatronic engineering

Previous positions in the last 10 years:

- Research fellow (Mechatronic engineering) at NCEA, USQ (2008 and continuing)

Dr Cheryl McCarthy is committed to leading high quality applied engineering research to service the rural sector through development of innovative and cost-effective automation and machine vision technologies for the real-world farming environment. Cheryl has worked on the development of outdoor machine vision systems for cropping and livestock. Cheryl's research featured in a 60 Minutes story last May, while global organisations such as John Deere are collaborating with Cheryl on research which has enormous commercial potential.

Cheryl has co-authored 17 peer-reviewed conference and journal papers and 10 industry reports, supervised 4 PhD students and been project leader for research totalling over \$1.58M. Cheryl engages relentlessly with industry stakeholders, in the last 3 years giving 30 presentations to industry, research and community forums and 10 ABC radio interviews, and featuring in over 20 articles in industry magazines and rural and regional newspapers.

Relevant publications

1. Shalal, N., Low, T., MCCARTHY, C. and Hancock, N. (2015) Orchard mapping and mobile robot localisation using on-board camera and laser scanner data fusion - Part A: Tree detection, *Computers and Electronics in Agriculture*, vol. 119, pp. 254-266. <http://www.sciencedirect.com/science/article/pii/S0168169915003002>
2. Shalal, N., Low, T., MCCARTHY, C. and Hancock, N. (2015) Orchard mapping and mobile robot localisation using on-board camera and laser scanner data fusion - Part B: Mapping and localisation, *Computers and Electronics in Agriculture*, vol. 119, pp. 267-278. <http://www.sciencedirect.com/science/article/pii/S0168169915003014>
3. MCCARTHY, C.L., SKOWRONSKI, V. and Zhao, B. (2014) Deployment and refinement of bait box remote surveillance system. Final Report. NCEA Publication 1005350/1, National Centre for Engineering in Agriculture, USQ, Toowoomba. 46 pages. www.portbees.com.au
4. MCCARTHY, C., Baillie, C. and Rees, S. (2013) Preliminary evaluation of shape and colour image sensing for automated weed identification in sugarcane, *International Sugar Journal*, vol. 1115, pp. 560-565.
5. <http://www.assct.com.au/media/pdfs/Ag%2013%20McCarthy%20et%20al.pdf>
6. MCCARTHY, C.L., Hancock, N.H. and Raine, S.R. (2010) Apparatus and infield evaluations of a prototype machine vision system for cotton plant internode length measurement, *Journal of Cotton Science*, vol. 14, pp. 221-232. <https://www.cotton.org/journal/2010-14/4/upload/JCS14-221.pdf>
7. MCCARTHY, C.L., Hancock, N.H. and Raine, S.R. (2010) Applied machine vision of plants - a review with implications for field deployment in automated farming operations, *Intelligent Service Robotics*, vol. 3, no. 4, pp. 209-217. <http://link.springer.com/article/10.1007%2Fs11370-010-0075-2#page-1>
8. MCCARTHY, C.L., Billingsley, J., Finch, N.A., Murray, P.J. and Gaughan, J. (2010) Cattle liveweight estimation using machine vision assessment of objective body measurements: first results, *Animal Production in Australia*, vol. 28, p. 120.

Project title	Investigator names % FTE*	\$	Years	Reports delivered on time or late
RPAS (UAV) automated surveillance of crop hotspots for improved management (Queensland Government Accelerate Fellowship) #	C McCarthy (CI) 0.7 FTE V Skowronski 0.1 FTE X Liu 0.4 FTE	\$600,000	2014-2017	Current - progress reports on time
Commercial development and evaluation of a machine vision-based weed spot sprayer (CRDC) #	C McCarthy (CI) 0.4 FTE S Rees 0.1 FTE	\$488,180	2013-2016	Current - progress reports on time
Precision weed sensing for pyrethrum (HIA) #	C McCarthy (CI) 0.1 FTE S Rees 0.4 FTE	\$615,537	2012-2016	On time
Deployment and refinement of bait box remote surveillance system (HIA/RIRDC) #	C McCarthy (CI) 0.2 FTE V Skowronski 0.2 FTE	\$107,000	2013-2014	On time
Remote sensing of beehives to improve surveillance (HIA/RIRDC) #	C McCarthy (CI) 0.2 FTE V Skowronski 0.2 FTE	\$152,000	2011-2013	On time
Precision sensing technology for infield identification of summer weeds (RIRDC) #	C McCarthy (CI) 0.45 FTE S Rees 0.45 FTE	\$224,000	2011-2012	On time
Individual animal management for grazing beef cattle (ARC Linkage project with UQ Gatton) #	P Murray (CI) 1 FTE C McCarthy 0.7 FTE	\$600,000	2008-2010	On time