

Christopher D. McCarthy

Canberra, ACT 2600
Australia

chris.mccarthy@rsise.anu.edu.au
<http://rsise.anu.edu.au/~cdmcc>

Education

- **Australian National University/NICTA,** 2005-present
PhD candidate, Robotics and Computer Vision
- **The University of Melbourne,** 2001-2005
Master of Computer Science (by research)
- **The University of Melbourne,** 1995-1999
BSc(hons) (Computer Science)
- **Aquinas Secondary College** (Ringwood, VIC, Australia), 1989-1994
Victorian Certificate of Education (TER 89.65)

PhD Project

Thesis topic : Biologically-inspired vision techniques for estimating time-to-collision and scene structure

Supervisors : Dr. Nick Barnes (NICTA), Prof. Mandyam Srinivasan (QBI, Univ of Queensland) and Prof. Giulio Sandini (IIT/Univ of Genova, Italy).

Summary : My PhD work aims to extend the links between the study of biological vision systems and the building of robust algorithms for the visual control of robotic systems. I have developed strategies for performing tasks such as autonomous landing and docking, as well as for threat avoidance in robotics systems. Underpinning my work are theories based on observations in low-level biological vision, and how the apparent motion of objects in the environment can be used to infer their proximity. In addition to robotics applications, I am examining the potential relevance of my developed theories and results to biological vision, and in particular, the Bionic Eye prosthetic retina project.

Selected Publications

A full list of my publications is provided on my web page.

- ‘A Robust Docking Strategy for a Mobile Robot using Flow Field Divergence’ by C. McCarthy, N. Barnes and R. Mahony. *IEEE Trans on Robotics*, 2008 (in press)
- ‘Real-time biologically-inspired depthmaps from spherical flow’ by C. McCarthy, N. Barnes and M V. Srinivasan. *Proc. IEEE International Conference on Robotics and Automation (ICRA2007)*, pp 4887-92, Rome, Italy, April 2007.
- ‘Comparison of temporal filters for optical flow estimation in continuous mobile robot navigation’ by C. McCarthy and N Barnes, *Springer Tracts in Advanced Robotics: Experimental Robotics IX: The 9th International Symposium on Experimental Robotics (Singapore 2004)*, Volume 21, pp 481-90, 2006. Paper was awarded *International Foundation of Robotics Research Student Fellowship Award*.
- ‘Performance of optical flow techniques for indoor navigation with a mobile robot’, by C. McCarthy and N. Barnes. *Proc. IEEE International Conference on Robotics and Automation (ICRA2004)*, pp 5093-5098, New Orleans, USA, 2004.

Work Experience

- **Visiting Researcher (PhD Placement)** 2007 (6 months)
Italian Institute of Technology (IIT), Robotics, Brain and Cognitive Sciences
As part of my PhD, I spent 6 months at the IIT developing a threat detection and avoidance system as part of their humanoid robot project, iCub.

- **Associate Lecturer (Level A)** 2001-2005
The University of Melbourne, Dept. Computer Science and Software Engineering
I coordinated, delivered lectures and tutorials for a wide range of undergraduate computer science subjects.
- **International Fellow** Dec 1999 - Dec 2001
Ngee Ann Polytechnic, School of InfoComm Technology, Singapore
I delivered lectures, and tutorials in programming (C++), software design and Computer Graphics.

Other Research Experience

- **Masters: Optical Flow Techniques for Mobile Robot Navigation,** 2001-2005
Under supervision of Dr. Nick Barnes (Uni of Melb, CSSE).
Project compared well known techniques for computing optical flow (visual motion) for the task of navigating a mobile robot (thesis available upon request).
- **Robot Soccer: International Robot Soccer World Cup: RoboCup,** 2001-2002
I co-supervised a small group of undergraduate students in developing software for a team of legged (Sony Aibo) robots to autonomously play soccer (Robocup). The team came fourth overall (from 20 competing teams) in the 2002 competition in Japan.
- **A Mobile Robot on the World Wide Web** (Honours project), 1998-1999
Supervised by Assoc Prof. Chiang Liu (Uni of Melb, CSSE).
By connecting a mobile robot to the world wide web and providing visual feedback to the end user, I examined different control protocols over a variable time-delayed communication medium.

Volunteer Work

- **Canberra Community Radio, 2XX, 98.3 FM,** 2005-2007
I was a regular presenter on 2XX's weekly science program, *Fuzzy Logic*. I reported the latest science news, as well as extended features on science stories of general interest.
- **Postgraduate and Research Students Association,** 2005-2007
During my time with PARSA, I held the position of vice-president (Nov 2007 to Feb 2008), and chair of the social and outreach team (July 2005 to Nov 2007). My duties included coordinating teams of volunteers, in organise social events, and attending university committee meetings.

Awards

- **Excellence in Teaching, 2005:** I received the Dept. Computer Science and Software Engineering's (Uni of Melb) 2004 *Excellence in Teaching* Award.
- **Student Paper Award, 2004:** Awarded the *International Foundation of Robotics Research Student Fellowship Award* for my paper in the 2004 International Experimental Robotics Symposium in Singapore.

Personal Attributes and Interests

I have excellent verbal and written communication skills. I am a friendly, reliable, and enthusiastic person with a solid work ethic. I am outgoing, a quick learner and always focussed on achieving the highest standard in my work.