

# Dr Chris Gaskett

*PhD (systems engineering), PMP*

*BE (comp. sys. eng.), BAppSci (comp. sci.)*

*member PMI*



[chris@gaskett.com](mailto:chris@gaskett.com)

Takamatsu, Kagawa, Shikoku, Japan (日本香川県高松市)

<http://chris.gaskett.com/>

## SKILLS SUMMARY

- Software development in Java, ANTLR, c++, Ruby (including Rails), Python, R, Scheme; under Unix, MS Windows, VxWorks, Mac OS X.
- Image processing, biological modelling, robotics, learning systems.
- Research skills including discovering and comparing prior work, developing novel solutions, experimental design, statistical analysis, reporting results.
- Project management including traditional ideas, agile/iterative/adaptive approaches, and beginning critical chain. Collaboration on international projects. Japanese language skills.
- Test driven development, version control (Git, Subversion); web and application development, realtime systems, vision systems, control systems, learning systems.
- Communication skills including writing for various audiences, public speaking, discussing technical issues with lay-people, and media liaison.
- Teaching, including curriculum development; coordinating national/international delivery of subjects.

## EXPERIENCE

**Technical Lead, CoolRock Software, Melbourne Australia**

**Nov 2008-**

**(Previously Senior Software Engineer)**

**April 2007-Oct 2008**

- Lead developer on all technical work and research for a maturing technology startup
- Project management for internal and customer deployment projects
- Email archiving and discovery software development in Java (Spring, RMI), c++ (mapi), c#
- Designed and implemented an IMAP server using ANTLR parser/lexer and mina

**Lecturer (tenured), School of Maths, Physics and Information Technology,**

**James Cook University, Cairns, Australia**

**Feb 2004-Mar 2007**

- Lecturing in project management, c++, unix, and database systems
- Development and coordination for project management subjects. Developed an industry projects scheme for students — leading to a national award (Carrick Citation) for outstanding contributions to student learning.
- Developed project subject contents, 50% traditional (PMBOK), 50% agile/iterative/adaptive
- Managed project subject delivery across Cairns, Townsville, Sydney, and Singapore campuses
- Coordinated student supervision by lecturers in Cairns to support student projects
- Carried out on-site review of School of IT organisation and lecturing at the Singapore campus
- Deployed wiki system for staff knowledge management, student project coordination (PMIS), added account management from university LDAP server (development in Python)
- Research on teaching in IT, and arachnid behaviour (including development of simulations in Ruby under Mac OS X)

**Research Engineer, Department of Humanoid Robotics and Computational Neuroscience,  
Advanced Telecommunications Research Institute International (ATR International),  
Kyoto, Japan Jul 2002-Feb 2004**

- Research on reaching strategies for a humanoid robot with active stereo vision
- Included learning system implementation (Kohonen self-organising map)
- Distributed system development in C++ and Scheme under MS Windows and VxWorks (real-time OS)
- Please see <http://chris.gaskett.com/research/> for published papers and videos

**Associate Researcher, Active Safety Laboratory,  
Toyota Central Research and Development Laboratories, Nagoya, Japan Jul 2001-Jun 2002**

- Research on identifying road regions through stereo vision
- Post processing of human gaze direction data from seeingmachines FaceLAB, leading to Japanese patent.
- Creating tools for use by other team members, development in MS Visual C++

**(Australian Postgraduate Award PhD scholarship) 1998-2001**

- Please see education section for details.
- Development in Java, C++ under MS Windows, Unix, VxWorks

**Salesperson, InterTan Australia (Tandy) 1994-1996**

- Retail hardware sales, modifications, and repairs.
- Included sales and customer service training

**Roll Film Inspector, Kodak Australasia Jan, Feb 1993**

- Quality control tasks. Roll film fault detection, microscopic inspection of film

**Computer Technician, Northern Metropolitan College of TAFE, Preston, Epping 1991-1992**

- Hardware installation, testing, repair

## EDUCATION

**PhD in Systems Engineering, "Q-Learning for Robot Control" 1998-2002**

Supervisor: Professor Alexander Zelinsky,  
Systems Engineering, The Australian National University (ANU), Canberra  
Development of a control system for using reinforcement learning.  
Electronics design for the Kambara autonomous underwater vehicle

**Bachelor Degree in Computer Systems Engineering 1993-1997**

with first-class honours, Royal Melbourne Institute of  
Technology University (RMITU)  
Fault trees and FMEA for fault finding (VDO instruments)

**Bachelor Degree in Computer Science 1993-1997**

with distinction, RMITU, Melbourne  
Speaker independent speech recognition using neural networks

Undergraduate results: 32 High Distinctions, 16 Distinctions, 4 Credits, no lower grades.  
Complete transcripts of results for undergraduate subjects are available on request.

**OTHER SUBJECTS, CERTIFICATIONS, AND COURSES COMPLETED**

<b>Project Management Professional (PMP) Certification</b> Project Management Institute (PMI)	<b>January 2008</b>
<b>Enterprise Database Systems—Oracle 10g</b> Led by Dr Carrie Lui, one semester at JCU (completed informally)	<b>2006</b>
<b>Teaching courses and graduate supervision courses at JCU</b>	<b>2004-2006</b>
<b>Japanese Language Proficiency Test, Level 4 Certified</b>	<b>2003</b>
<b>Machine Learning graduate course</b> Led by Dr Jonathan Baxter and Dr Peter Bartlett, ANU. Section on intelligent control systems including neural networks and fuzzy control delivered by myself.	<b>2000</b>
<b>Australian Music Examination Board, music theory and practice level 4</b>	<b>1992</b>

**AWARDS**

<b>Carrick Citation for Outstanding Contributions to Student Learning</b> National award from the Carrick institute, a government scheme for promoting excellence in university teaching. Awarded for <i>“creation of industry project subjects that cultivate practical skills for understanding problems and managing risks, supported by collaborative tools for peer review and reflection.”</i>	<b>2006</b>
<b>JCU Inclusive Practice Award</b> Based on nominations and votes from users of JCU disability support service. Teaching experience includes students with hearing impairments, vision impairments, and physical disabilities.	<b>2005</b>
<b>Kernot Medal: RMITU engineering faculty award</b> Best final year engineering student, across all disciplines at RMITU	<b>1997</b>
<b>Double Degree Fifth Year Prize</b> Best final year computer science and computer systems engineering student at RMITU	<b>1997</b>
<b>ENGenius Display Award</b> Best display at ENGenius engineering conference, Melbourne	<b>1996</b>
<b>RS Components Award</b> RMITU, excellence in electronic engineering design	<b>1995</b>
<b>KRONE Australia Prize</b> RMITU, excellence in communication engineering	<b>1994</b>

**MEDIA APPEARANCES**

- Contributions to animations for a dengue fever/mosquito story on ABC's "Catalyst", 2005
- Article in business and economy magazine "J@pan Inc", 2003
- Appearances on Japanese television news programs "You" and "News Station", 2003

## INTERNATIONAL COLLABORATION

Working with CoolRock Software's CEO and sales team, located in USA, and the development team, located in Australia.

Coordination of project management course running at JCU Singapore. On-site audit of JCU Singapore's IT lecturing.

Continued research with ATR International (Japan) while at JCU.

Arranged visits to JCU for researchers:

- Associate Professor Yoshio Matsumoto from Nara Institute of Science and Technology (Nara, Japan)
- Dr Gareth Loy from KTH Royal Institute of Technology (Stockholm, Sweden)
- Mr Luke Fletcher from the Australian National University (Canberra)
- Professor Yoshihito Takase from Tezukayama University (Nara, Japan)
- Mr Tsuyoshi Suenaga from Nara Institute of Science and Technology (Nara, Japan)

## PUBLICATIONS

Please see <http://chris.gaskett.com/research/> for demonstration videos and copies of papers.

- **Japanese Patent: 視線座標変換方法、そのプログラムおよびそれを記録した記録媒体 (Gaze coordinate transformation method)** by Chris Gaskett, 2002. Rights owned by Toyota Central Research and Development Laboratory
- **Is Optimal Foraging a Realistic Expectation in Orb-web Spiders?** by W. Edwards, P. A. Whytlaw, B. C. Congdon, and C. Gaskett, *Ecological Entomology*, Vol 34, 2009
- **Creativity in the Cane Fields: Motivating and Engaging IT Students Through Games**, C. Lemmon, N.J. Bidwell, M. Hooper, C. Gaskett, J. Holdsworth, and P. Musumeci, *2nd Annual Microsoft Academic Days Conference on Game Development, 2007*
- **That Elusive Veggie Airline Meal...** by Chris Gaskett, popular article for national newspaper *Masala Times*, Nov 2006
- **Foveated Vision Systems with Two Cameras per Eye**, Ales Ude, Chris Gaskett, and Gordon Cheng, *Proceedings of the IEEE/RSJ IEEE Int. Conf. Robotics and Automation (ICRA 2006)*, (Orlando, Florida May 2006)  
We present an exhaustive analysis of the relationship between the positions of the observed point in the foveal and peripheral view with respect to the intrinsic and extrinsic parameters of both cameras and 3-D point position.
- **Hand-Eye Coordination through Endpoint Closed-Loop and Learned Endpoint Open-Loop Visual Servo Control**, Chris Gaskett, Ales Ude, and Gordon Cheng, *The International Journal of Humanoid Robotics*, Vol 2, No 2, 2005 pp. 203-224  
We propose a hand-eye coordination system for a humanoid robot that supports bimanual reaching. The system combines endpoint closed-loop and open-loop visual servo control. The closed-loop component moves the eyes, head, arms, and torso, based on the position of the target and the robot's hands, as seen by the robot's head-mounted cameras. The open-loop component uses a motor-motor mapping that is learnt online to support movement when visual cues are not available.
- **Support Vector Machines and Gabor Kernels for Object Recognition on a Humanoid With Active Foveated Vision**, Ales Ude, Chris Gaskett, and Gordon Cheng, *Proceedings of the IEEE/RSJ Int. Conf. Intelligent Robots and Systems (IROS 2004)*, (Sendai, Japan, September 2004)

- **Online Learning of a Motor Map for Humanoid Robot Reaching**, Chris Gaskett and Gordon Cheng, *Proceedings of the 2nd International Conference on Computational Intelligence, Robotics and Autonomous Systems (CIRAS 2003)*, (Singapore, December 2003)
- **Reinforcement Learning Under Circumstances Beyond its Control**, Chris Gaskett, *Proceedings of the International Conference on Computational Intelligence for Modelling Control and Automation (CIMCA2003)*, (Vienna, Austria, February 2003)  
This paper describes an RL algorithm that uses an idea from decision theory.
- **Q-Learning for Robot Control**, Chris Gaskett, *PhD thesis from the Robotic Systems Laboratory, part of the Research School of Information Sciences and Engineering at the Australian National University*.  
As well as more detailed versions of the earlier material, the thesis includes a partial solution to the rising value problem identified by Thrun and Schwartz (1993).
- **Learning Implicit Models during Target Pursuit**, Chris Gaskett, Peter Brown, Gordon Cheng and Alex Zelinsky, *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA2003)*, (Taiwan, May 2003). This paper demonstrates control of one joint of an active head and shows that the neural network has learnt a model of movement under gravity.
- **Reinforcement Learning for a Vision Based Mobile Robot**, Chris Gaskett, Luke Fletcher, and Alex Zelinsky, *Proceedings of IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS2000)* (Takamatsu, Japan, October 2000).  
This paper applied the algorithm to wandering and servoing for a mobile robot. It also demonstrated learning from other behaviours.
- **Reinforcement Learning for Visual Servoing of a Mobile Robot**, Chris Gaskett, Luke Fletcher, and Alex Zelinsky, *Proceedings of the Australian Conference on Robotics and Automation (ACRA2000)*, (Melbourne Australia, August 2000)  
This paper applied the algorithm to visual servoing of a mobile robot.
- **Q-Learning in Continuous State and Action Spaces**, Chris Gaskett, David Wettergreen, and Alex Zelinsky, *Proceedings of the 12th Australian Joint Conference on Artificial Intelligence* © Springer-Verlag (Sydney Australia, 1999).  
This paper demonstrated improved performance through advantage learning. It also contained a survey of continuous state and action q-learning methods and argued for the importance of off-policy learning.
- **Autonomous Control and Guidance for an Underwater Robotic Vehicle**, David Wettergreen, Chris Gaskett, and Alex Zelinsky, *Proceedings of the International Conference on Field and Service Robotics (FSR'99)* (Pittsburgh, USA, September 1999)
- **Reinforcement Learning for a Visually-Guided Autonomous Underwater Vehicle**, David Wettergreen, Chris Gaskett, and Alex Zelinsky, *Proceedings of the International Symposium on Unmanned Untethered Submersibles Technology (UUST'99)* (Durham, New Hampshire, USA, August 1999)
- **Reinforcement Learning applied to the control of an Autonomous Underwater Vehicle**, Chris Gaskett, David Wettergreen, and Alex Zelinsky, *Proceedings of Australian Conference on Robotics and Automation (Brisbane, Australia, March 1999)*.  
This paper introduced the wire fitted neural network algorithm.
- **Development of a Visually-Guided Autonomous Underwater Vehicle**, David Wettergreen, Chris Gaskett, and Alex Zelinsky, *Proceedings of IEEE OCEANS'98* (Nice, France, September 1998)