Thierry Peynot

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Personal Info:
French Citizen
Born in 1978
Single

CURRENT SITUATION

Since 2007 **Research Fellow** at the Australian Centre for Field Robotics, The University of Sydney, Australia

EDUCATION AND QUALIFICATIONS

2002-2006 **PhD** in Automatic Systems (speciality: Robotics) – with Honours
INPT (National Polytechnic Institute), Toulouse, France

2002 **MSc.** in Automatic Systems – with Honours
INPT (National Polytechnic Institute), Toulouse, France

1999-2002 **Automatics and Electrotechnology Engineer** (Speciality: Automation and Industrial Computer Science)
INPT-ENSEEIHT (National Engineering School of Electrotechnology, Electronics, Computer Science, Hydraulics and Telecommunication), Toulouse, France

2001 **Cambridge Certificate of Proficiency in English**, Toulouse, France

1996 **Higher School Cerficate** equivalent, in Science, speciality Mathematics – with Honours
Jean Rostand High School, Chantilly, France

PAST PROFESSIONAL EXPERIENCE

2010 **Visiting Scholar** (May-June), INSA, University of Toulouse, France.

2005-2007 **Assistant Professor**
University Paul Sabatier (teaching) & LAAS-CNRS (research), Toulouse, France
Main Courses: Control of Discrete Event Systems, Linear Systems Automatic Control, Robotics

2002-2006 **PhD Student,** Thesis prepared at LAAS-CNRS, RIA group (Robotics and Artifial Intelligence), Toulouse, France
Autonomous Selection and Monitoring of Navigation Modes for a Mobile Robot in Natural Environments
Advisers: Raja Chatila and Simon Lacroix

2005 **Intern** at **NASA Ames Research Center**, Moffett Field, California, USA. Employer: Mission Critical Technologies Inc.
$5M FY05 program *CDS (Collaborative Decision Systems)*
NASA Group Achievement Award 2006.
Contact: Kanna Rajan (now at MBARI, Monterrey, CA)

2002-2005 **Teaching Assistant** at University Paul Sabatier, Toulouse, France

2002 **Postgraduate Student** (Master Thesis) - 6 months - LAAS–CNRS, RIA group, Toulouse, France
Locomotion Control of an outdoor all-terrain robot.
Adviser: Simon Lacroix

2001 **Engineer Intern** - 2 months - ETAM Company - Saint Ouen, France
Functional analysis of an automatic sorting machine

2000 Intern – 3M, PI&CS Dept. (Process Instrumentation and Control Systems)- Cergy-Pontoise, France
Functional analysis of a new production line and its automaton

MAIN RESEARCH INTERESTS

Unmanned Ground Vehicles, Planetary Rovers

Reliable Perception, Multimodal Sensing

Mitigation of Failures and Fault Detection

KEY SCIENTIFIC SKILLS

Computer Vision, Range Sensing (Laser, Radar, Stereovision), Sensor Data Fusion, Perception

Navigation and Locomotion of Mobile Robots

Probabilistic Reasoning, Diagnosis

Robotic Hardware and Software

LANGUAGE SKILLS

French: Native Speaker

English & Spanish: Fluent

AWARDS

NASA Group Achievement Award, 2006.

Research Scholarship of the Ministry of National Education, Research and Technology, for PhD studies, 2002-2005.

Teaching Assistantship, University Paul Sabatier, Toulouse, France, 2002-2005.

CONTINUING EDUCATION: COURSES COMPLETED

Foundations of Research Supervision, Institute of Teaching and Learning, The University of Sydney, February 2013.

Apply First Aid Certificate (Senior First Aid), Sydney University Sports & Fitness, 28 April 2012 (course provided by Cynergex Group).

Principles and Practice of University Teaching and Learning, Institute of Teaching and Learning, The University of Sydney, June 2008.

Training to Higher Education Teaching (Initiation à l'Enseignement Supérieur), Centre d'Initiation à l'Enseignement Supérieur (CIES), Toulouse, France, 2002-2005.

ROLES IN INTERNATIONAL CONFERENCE AND JOURNAL COMMITTEES

Guest Editor, *Journal of Field Robotics - Special Issue on Alternative Sensing Techniques for Robot Perception*, to appear in 2013.

Lead Organiser, Workshop: Beyond Laser and Vision: Alternative Sensing Techniques for Robotic Perception, *Robotics: Science and Systems (RSS) conference*, 11-12 July 2012.

Associate Editor, *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2008, 2009, 2010, 2011, 2013.

Associate Editor, *IEEE International Conference on Robotics and Automation (ICRA)*, 2011.

Paper Chair, *ARAA Australasian Conference on Robotics and Automation (ACRA)*, 2009.

Publicity Chair (Oceania), *Pacific-Rim Symposium on Image and Video Technology (PSIVT)*, 2013.

Program Committee (PC) Member, *International Joint Conference on Artificial Intelligence (IJCAI)*, 2013.

PC Member, *Seventh IARP Workshop on Technical Challenges for Dependable Robots in Human Environments (DRHE)*, 2010.

PC Member and **Reviewer**, *ARAA Australasian Conference on Robotics and Automation (ACRA)*, 2009, 2010, 2011, 2012, 2013.

PC Member and **Reviewer**, *Mexican International Conference on Artificial Intelligence (MICAI)*, 2011, 2012.

PC Member, *Mexican Conference on Pattern Recognition (MCPR)*, 2013.

Reviewer, *The International Journal of Robotics Research (IJRR)*, 2012.

Reviewer, *IEEE Transactions on Automation Science and Engineering (T-ASE)*, 2012.

Reviewer, *Journal of Field Robotics (JFR)*, 2010.

Reviewer, *Robotics and Autonomous Systems*, 2013.

Reviewer, *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2005, 2008, 2009, 2010, 2012.

Reviewer, *IEEE International Conference on Robotics and Automation (ICRA)*, 2009, 2011, 2013.

Reviewer, *International Conference on Intelligent Autonomous Systems (IAS)*, 2012.

Reviewer and **Session Chair**, *Latin American Robotics Competition (LARC) & Colombian Conference on Automatic Control*, 2011.

Session Chair, *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, "Computer Vision II" in 2010, "Estimation & Sensor Fusion" in 2011.

Session Chair, *ARAA Australasian Conference on Robotics and Automation (ACRA)*, "Computer Vision I" in 2009, "Vision and Sensing I" 2010.

MAIN RESEARCH PROJECTS

Sensor Data Integrity and Mitigation of Perceptual Failures, 2010-2013 (Principal Investigator)

This project funded by the Asian Office of Aerospace Research and Development (AOARD) aims at understanding sensor performance and data quality in challenging environmental conditions, and is investigating methods for automatic detection and mitigation of perception failures.

Pathways to Space, 2011-2013 (Research Lead for the ACFR node)

This project is an education and research program funded under the Australian Government's Australian Space Research program. It aims to build skills for a future Australian space program through encouraging interest in science and engineering among high school students, by exposing them to real science and engineering research. It involves the development of state-of-the-art research in Space exploration using a prototype of planetary rover, which operates at a Mars Yard at the Powerhouse Museum in Sydney. This is a collaborative project between the Australian Centre for Astrobiology at the University of New South Wales, the ACFR at the University of Sydney, the Powerhouse Museum and Cisco Systems.

Centre for Intelligent Mobile Systems, 2009-2012 (Research Lead for Persistent Autonomy)

This centre, funded by BAE Systems as part of an ongoing partnership with the University of Sydney, is composed of the following research groups: Perception for Autonomy, Persistent Autonomy, All-Source Navigation, and Coordinated Sensor Planning, in addition to technical resources to develop new multi-sensor platforms to demonstrate the research applications.

Sensor Data Integrity, 2008 (co-Leader)

This project was funded by the Asian Office of Aerospace Research and Development (AOARD) and the Air Force Research Laboratory (AFRL), to investigate practical issues of sensor data integrity. The project involved gathering large data sets in controlled and variable environmental conditions using a wide variety of sensors, including lasers, radar, vision & infrared cameras, and a high accuracy positioning system.

Multi-Mode Rover for Higher Mobility on Rough Terrain (R2M), 2003-2006

This project, part of the Robea Program (Robotics and Artificial Entities), was funded by the French National Scientific Research Center. It involved LAAS-CNRS in association with the Robotics Laboratory in Paris (LRP), the LASMEA/Cemagref in Clermont-Ferrand and the Defense Research Agency Center in Angers. The main aim

was the development of a wheel-legged mini rover endowed with various locomotion modes, the corresponding control laws, perception algorithms based on colour stereovision, and monitoring.

Collaborative Decision Systems (CDS), 2005

This project of the NASA Ames Research Center, Moffett Field, California, USA, concerned the collaboration of autonomous rovers with EVA astronauts for planetary exploration missions. My role was among the IDEA (Intelligent Distributed Executive Architecture) team, from February to July from France, and from July to the end of September on site at NASA Ames. Collaboration with the whole CDS team during the various integrated tests phases. The project was concluded by public demonstrations on the 29th and 30th of September and 1st of October, 2005. The CDS team received the *NASA Group Achievement Award* on May 2006.

SUPERVISION OF RESEARCH STUDENTS

Current Postgraduate Students:

1. Christopher Brunner, **PhD Thesis**, The University of Sydney, since 2009 (Main Supervisor).
2. Ken Ho, **PhD Thesis**, The University of Sydney, since 2010 (Main Supervisor).
3. Macos P. Gerardo Castro, **PhD Thesis**, The University of Sydney, since 2011 (Main Supervisor).
4. Sing Ting (Angela) Lui, **PhD Thesis**, The University of Sydney, since 2012 (Associate Supervisor).
5. Timothy Patten, **PhD Thesis**, The University of Sydney, since 2012 (Associate Supervisor).

Alumni (Postgraduate Students):

6. Rowan McAllister, **Master Thesis**, The University of Sydney, completed in Sept. 2012 (Assoc. Supervisor). Now PhD student at the University of Cambridge, UK.

Past Visiting Postgraduate Students:

7. Juhana Ahtiainen, PhD student, visiting from Aalto University, Finland, 2012-2013.
8. Matthieu Simonneau, Master student, visiting from ESEO Angers, France, 2012.
9. Brieuc Mallet, Master student, visiting from the University of Toulouse, France, 2012.
10. Valeria Ogliaro, Master student, visiting from University of Genoa, 2010.
11. Mathieu Bernou, Master student, visiting from IUP SI, University of Toulouse, France, 2009.
12. Marie Amiot, Master student, visiting from IUP SI, University of Toulouse, France, 2009.
13. Sami Terho, PhD student, visiting from Helsinki University of Technology, Finland, 2008.

Current Undergraduate Student:

14. Fouad Sukkar, Undergraudate Engineering Project (B.E.), The University of Sydney, 2013.

Past Undergraduate Students:

15. Abhinav Dua, Undergraduate Project (B.E.), The University of Sydney, 2011-2012.
16. Philip Gun, Undergraduate Honours Thesis (co-supervised), The University of Sydney, 2011.
17. Andrew Wheeler, Undergraduate Project (B.E.), The University of Sydney, 2009-2010.
18. Abdallah Kassir, Undergraduate Honours Thesis, The University of Sydney, 2009.
19. Luke Menzies, Undergraduate Honours Thesis, The University of Sydney, 2009.

THESIS EXAMINATION

Thomas L.P. Allen, “Time-Optimal Active Decision Making”, PhD Thesis, The University of Sydney, 2011.

TEACHING ACTIVITY

2008-2013

Co-Lecturer and Associate Coordinator, "Computer Vision and Image Processing" (UoS AMME4710), 4th year, School of AMME, Faculty of Engineering & IT, The University of Sydney, since 2008.

Invited Lecturer, "Mobile Robotics and Multi-Sensor Perception" (20h lectures, in Spanish and English), Master of Mechatronics, Universidad Militar Nueva Granada, Bogota, Colombia, October 2011.

Invited Lecturer, "Introduction to Mobile Robotics" (10h course, in English with introduction and questions in Spanish), Master of Artificial Intelligence, Universidad Veracruzana en Xalapa, Mexico, September 2010.

Guest Lecturer, "Sensing and Perception for Robotics", Postgraduate Studies, ACFR, The University of Sydney, since 2011.

Guest Lecturer, "Experimental Robotics" (MTRX 4700), 4th year, School of AMME, Faculty of Engineering & IT, The University of Sydney, 2008, 2009, 2010, 2012, 2013.

Guest Lecturer, "Introduction to Mechatronics" (MTRX 1701), 1st year, School of AMME, Faculty of Engineering & IT, The University of Sydney, 2009.

2002-2007

Assistant Professor, EEA Department, Faculty of Physics Chemistry and Automation, University Paul Sabatier, Toulouse, France, 2005-2007.

Teaching Assistant, EEA Department, Faculty of Physics Chemistry and Automation, University Paul Sabatier, Toulouse, France, 2002-2005.

Total number of teaching hours between 2002 and 2007: 663 hours.

Main Courses (2002-2007):

- Computer Vision, Lectures, 4th year, 2006-2007.
- Robotics: Control of Manipulators, Tutorials & Labs, Master, 2006-2007.
- Programming in C language, Tutorials, 4th year, 2006-2007.
- Discrete event system control, Tutorials & Labs, 3rd & 4th year, 2002-2007.
- Real-Time IT and parallelism, Labs, 4th year, 2004-2007.
- Linear System Control, Labs, 1st & 2nd year, 2002-2007.
- Combinatory and sequential logic, Labs, 2nd year, 2003-2006.

PATENTS

1. C. Brunner and **T. Peynot**, "Sensor Data Processing" ("Visual Metrics for Outdoor Perception"), The University of Sydney, Publication number: WO 2012/024730 A1, Application number: PCT AU2011/001090, published 1 March 2012, filed 24 August 2011.
2. **T. Peynot**, "Sensor Data Processing" ("Laser-Camera Data Comparison for Improved Perception Integrity"), The University of Sydney, Publication numbers: WO 2011/109856, EP2545707A1, US20130058527, Application number: PCT/AU2011/000205, published September 2011, filed February 2011.

MAIN PEER-REVIEWED PUBLICATIONS

Book Chapters

1. C. Brunner and **T. Peynot**. "Perception Quality Evaluation for Visual and Infrared Cameras in Challenging Environmental Conditions". In O. Khatib, V. Kumar and G. Sukhatme (editors), *Experimental Robotics*, Springer Tracts in Advanced Robotics, Vol. 79, Springer-Verlag, Berlin Heidelberg, 11 pp. 711-725, 2014.
2. **T. Peynot**, R. Fitch, R. McAllister and A. Alempijevic. "Resilient Navigation through Probabilistic Modality Reconfiguration". In S. Lee, H. Cho, K.-J. Yoon and J. Lee (editors), *Intelligent Autonomous Systems 12*, Springer-Verlag, Berlin, pp. 75-88, 2013.
3. **T. Peynot** and S. Lacroix. "Selection and Monitoring of Navigation modes for an Autonomous Rover". In O. Khatib, V. Kumar and D. Rus (editors), *Experimental Robotics,* Springer Tracts in Advanced Robotics, Vol. 39, Springer-Verlag, Berlin Heidelberg, pp. 121-130, 2008.

International Journals

4. C. Brunner, **T. Peynot**, T. Vidal-Calleja and J.P. Underwood. "Selective Combination of Visual and Thermal Imaging for Resilient Localisation in Adverse Conditions: Day and Night, Smoke and Fire". In *Journal of Field Robotics*, Vol. 30, Issue 4, July/August 2013.

5. C. Brunner, **T. Peynot** and T. Vidal-Calleja. "Visual Metrics for the Evaluation of Sensor Data Quality in Outdoor Perception". In *International Journal of Intelligent Control and Systems. Special Edition: Quantifying the Performance of Intelligent Systems*, Vol. 16, Number 2, June 2011.

6. **T. Peynot**, S. Scheding and S. Terho. "The Marulan Data Sets: Multi-Sensor Perception in Natural Environment with Challenging Conditions". In *International Journal of Robotics Research* (IJRR), Vol. 29, Issue 13, November 2010.

7. J.P. Underwood, A. Hill, **T. Peynot** and S. Scheding. "Error modeling and calibration of exteroceptive sensors for accurate mapping applications". In *Journal of Field Robotics. Special Edition: Three Dimensional Mapping, Part III*, Vol. 27, Issue 1, January/February 2010.

International Conferences

8. K. Ho, **T. Peynot** and S. Sukkarieh. "A Near-to-Far Non-Parametric Learning Approach for Estimating Traversability in Deformable Terrain". To appear in *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Tokyo, Japan, November 2013. (Accepted 30 June 2013).

9. J. Ahtiainen, **T. Peynot**, J. Saarinen and S. Scheding. "Augmenting Traversability Maps with Ultra-Wideband Radar to Enhance Obstacle Detection in Vegetated Environments". To appear in *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Tokyo, Japan, November 2013. (Accepted 30 June 2013).

10. K. Ho, **T. Peynot** and S. Sukkarieh. "Traversability Estimation for a Planetary Rover via Experimental Kernel Learning in a Gaussian Process Framework". In *IEEE International Conference on Robotics and Automation (ICRA)*, Karlsruhe, Germany, May 2013.

11. M. P. Gerardo Castro and **T. Peynot**. "Laser-to-Radar Sensing Redundancy for Resilient Perception in Adverse Environmental Conditions". In *ARAA Australasian Conference on Robotics and Automation (ACRA),* Wellington, New Zealand, December 2012.

12. R. McAllister, **T. Peynot**, R. Fitch and S. Sukkarieh. "Motion Planning and Stochastic Control with Experimental Validation on a Planetary Rover". In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Vilamoura, Portugal, October 2012.

13. R. Li, **T. Peynot** and D. Flannery. "Mawson the Astrobiologist Rover: Towards Automatic Recognition of Stromatolites". In *International Symposium on Artificial Intelligence, Robotics and Automation in Space (i-SAIRAS)*, Turin, Italy, September 2012.

14. **T. Peynot**, R. Fitch, R. McAllister and A. Alempijevic. "Resilient Navigation through Probabilistic Modality Reconfiguration". In *12th International Conference on Intelligent Autonomous Systems (IAS)*, Jeju Island, Korea, June 2012.

15. K. Ho, **T. Peynot** and S. Sukkarieh. "Analysis of Terrain Geometry Representations for Traversability of a Mars Rover". In *11th NCSS/NSSA Australian Space Science Conference*, Canberra, Australia, September 2011.

16. C. Brunner, **T. Peynot** and T. Vidal-Calleja. "Combining Multiple Sensor Modalities for a Localisation Robust to Smoke". In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, San Francisco, CA, September 2011 (Acceptance rate: 32%).

17. A. Kassir and **T. Peynot**. "Reliable Automatic Camera-Laser Calibration". In *Australasian Conference on Robotics and Automation (ACRA),* Brisbane, Australia, December 2010.

18. C. Brunner and **T. Peynot**. "Perception Quality Evaluation for Visual and Infrared Cameras in Challenging Environmental Conditions". In *12th International Symposium on Experimental Robotics*, Delhi, India, December 2010.

19. **T. Peynot** and A. Kassir. "Laser-Camera Discrepancies and Reliable Perception in Outdoor Robotics". In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Taipei, Taiwan, October 2010.

20. C. Brunner and **T. Peynot**. "Visual Metrics for the Evaluation of Sensor Data Quality in Outdoor Perception". In *Performance Metrics for Intelligent Systems Workshop (PerMIS),* Baltimore, MD, USA, September 2010.

21. **T. Peynot**, J. Underwood and A. Kassir. "Sensor Data Consistency Monitoring for the Prevention of Perceptual Failures in Outdoor Robotics". In *Seventh IARP Workshop on Technical Challenges for Dependable Robots in Human Environments (DRHE)*, Toulouse, France, June 2010.

22. C. Brunner, **T. Peynot** and J. Underwood. "Towards Discrimination of Challenging Conditions for UGVs with Visual and Infrared Sensors". In *Australasian Conference on Robotics and Automation (ACRA),* Sydney, Australia, December 2009.

23. **T. Peynot**, J. Underwood and S. Scheding. "Towards Reliable Perception for Unmanned Ground Vehicles in Challenging Conditions". In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Saint Louis, MO, USA, October 2009.

24. **T. Peynot** and S. Lacroix. "Selection and Monitoring of Navigation Modes for an Autonomous Rover". In *10th International Symposium on Experimental Robotics (ISER)*, Rio de Janeiro, Brazil, July 2006.

25. **T. Peynot** and S. Lacroix. "A Probabilistic Framework to Monitor a Multi-Mode Outdoor Robot". In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Edmonton, Canada, August 2005.

26. **T. Peynot** and S. Lacroix. "Enhanced Locomotion Control for a Planetary Rover". In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS),* Las Vegas, NV, USA, October 2003.

OTHER PUBLICATIONS IN ENGLISH

27. C. Brunner, **T. Peynot** and T. Vidal-Calleja. "Automatic Selection of Sensor Modality for Resilient Localisation in Low Visibility Conditions". *Beyond Laser and Vision: Alternative Sensing Techniques for Robotics Perception, Workshop, Robotics: Science and Systems (RSS)*, Sydney, Australia, 11-12 July 2012.

28. M. P. Gerardo Castro and **T. Peynot**. "Laser-to-Radar Sensing Redundancy for Resilient Perception in Adverse Environmental Conditions". *Beyond Laser and Vision: Alternative Sensing Techniques for Robotics Perception, Workshop, Robotics: Science and Systems (RSS)*, Sydney, Australia, 11-12 July 2012.

29. **T. Peynot**, C. Brunner and J. Underwood. "Persistent Perception for Long-term Autonomy of Ground Vehicles", *Workshop on Long-term Autonomy. IEEE International Conference on Robotics and Automation (ICRA)*, Shanghai, China, 9 May 2011. (Invited Paper).

30. **T. Peynot**, R. Fitch, R. McAllister and A. Alempijevic. "Autonomous Reconfiguration of a Multi-Modal Mobile Robot". *Workshop on Automated Diagnosis, Repair and Re-Configuration of Robot Systems, IEEE International Conference on Robotics and Automation (ICRA)*, Shanghai, China, 9 May 2011

31. **T. Peynot** and S. Scheding. "Datasets for the Evaluation of Multi-Sensor Perception in Natural Environments with Challenging Conditions". *Workshop on Good Experimental Methodology in Robotics, Robotics: Science and Systems (RSS)*, Seattle, WA, USA, June 2009.

32. **T. Peynot**, S. Terho and S. Scheding. "Sensor Data Integrity: Multi-Sensor Perception for Unmanned Ground Vehicle", Technical Report ACFR-TR-2009-002, Australian Centre for Field Robotics, The University of Sydney, February 2009.

33. **T. Peynot** and S. Lacroix. "Selection and Monitoring of Rover Navigation modes: A Probabilistic Diagnosis Approach". *Space Robotics Workshop, IEEE International Conference on Robotics and Automation (ICRA)*, Roma, Italy, April 2007.

34. **T. Peynot** and S. Lacroix. "Selection and Monitoring of Navigation modes for an Autonomous Rover". *9th ESA Workshop on Advanced Space Technologies for Robotics and Automation (ASTRA)*, Noordwijk, The Netherlands, November 2006.

SELECTED PUBLIC EVENTS AND DEMONSTRATIONS

1. *Engineering Innovations* seminar series, Engineers Australia Sydney Southern Highlands and Tablelands Regional Group, presentation "GPS and Recent Alternatives to Localisation" delivered to professional engineers in Mittagong, NSW, Australia, 29 August 2013.

2. *Abigroup Autumn School of Engineering*, organised at The University of Sydney, 16 April 2012. Talk "The Robots are coming!: A brief introduction to Robotics" delivered to Year 11 and 12 Sydney Metro students interested in engineering careers.
3. *Engineers Australia Discover Engineering Day*, Sydney, Australia, March 2009 & March 2010. Demonstration of multi-modal sensing on an autonomous vehicle at Discover Engineering Day, an event promoting engineering to high school students, organised by *Engineers Australia*.
4. *Honeywell Summer School*, School of AMME, The University of Sydney, Australia, 11 December 2009. Demonstration of autonomous ground robots.
5. *CDS Final Demonstration*, NASA Ames Research Centre, Moffett Field, California, USA, 29-30 September & 1 October 2005. Final demonstration of the NASA project CDS (Collaborative Decision systems). Media coverage: news reports in American TV channels (including ABC7, CBS5, NBC11 and UPN31) and European TV channels (RAI-TV and Discovery Europe), and articles in newspapers such as the San Francisco Chronicle and the Palo Alto Times.
6. *Industrie 2004* exhibition, Paris Nord Villepinte, France, 23-26 March 2004. Presentation of the planetary rover LAMA at the exhibition *Industrie 2004* and the *International Symposium on Robotics* (ISR), jointly organised that year. This exhibition involved 3,000 exhibitors and attracted almost 100,000 visitors from all over Europe.

INVITED PRESENTATIONS

1. "GPS and Recent Alternatives to Localisation", Engineers Australia Sydney Southern Highlands and Tablelands Group, *Engineering Innovations* Seminars, Mittagong, Australia, 29 August 2013.
2. "Resilient Perception and Navigation for Unmanned Ground Vehicles in Challenging Environmental Conditions", Queensland University of Technology (QUT), Brisbane, Australia, 31 July 2013.
3. "Resilient Perception for Unmanned Ground Vehicles in Challenging Environmental Conditions", Jet Propulsion Laboratory (JPL), NASA, Pasadena, CA, 18 July 2013.
4. "Unmanned Ground Vehicles", Short Course on Unmanned Systems, Defence Material Organisation (DMO), Canberra, Australia, 20 June 2013.
5. "Towards Resilient Perception for Unmanned Ground Vehicles", LAAS-CNRS, Toulouse, France, 28 May 2013.
6. "Experimental Learning for Traversability Estimation and Stochastic Motion Planning on a Planetary Rover", ICRA 2013 Planetary Rover Workshop, Karlsruhe, Germany, 10 May 2013.
7. "Sensor Data Integrity and Mitigation of Perceptual Failures", Air Force Office of Scientific Research (AFOSR) Program Reviews, Washington, DC, USA, 30 January 2013.
8. "Resilient Perception: Multimodal Sensing and Perceptual Failure Mitigation", Agency for Defense Development (ADD), Daejeon, South Korea, 25 June 2012.
9. "Sensor Data Integrity and Mitigation of Perceptual Failures", Air Force Office of Scientific Research (AFOSR) Program Reviews, Arlington, VA, USA, 25 January 2012.
10. "Dependable Autonomy of Planetary Rovers", Congreso Internacional en Aeronautica: Avances en desarollo e innovacion tecnologica, Universidad Militar Nueva Granada, Bogota, Colombia, 12 October 2011.
11. "Perception Integrity and Dependable Autonomy for Mobile Robots", Universidad Militar Nueva Granada, Bogota, Colombia, 5 October 2011.
12. "Perception Integrity and Dependable Autonomy for Mobile Robots", Computer Science and Artificial Intelligence Laboratory (CSAIL), Massachussetts Institute of Technology (MIT), Cambridge, MA, 9 June 2011.
13. "Sensor Data Integrity and Mitigation of Perceptual Failures", Air Force Office of Scientific Research (AFOSR) Robust Computational Intelligence Program Review, Arlington, VA, USA, 7 June 2011.
14. "Persistent Perception for Long-term Autonomy of Ground Vehicles", Workshop on Long-term Autonomy, IEEE International Conference on Robotics and Automation (ICRA), Shanghai, China, 9 May 2011.
15. "Perception Integrity and Dependable Autonomy for Mobile Robots", National ICT Australia (NICTA), Canberra, ACT, Australia, 29 April 2011.

16. "Field Robotics at ACFR, Sydney & Perception Integrity for Autonomous Ground Vehicles in Challenging Environmental Conditions", Universidad Veracruzana en Xalapa, Mexico, 14 September 2010.
17. "Field Robotics at ACFR, The University of Sydney - Perception Integrity for Autonomous Ground Vehicles in Challenging Environmental Conditions", Technocentre Renault, Guyancourt, France, 21 June 2010.
18. "Field Robotics and Perception at ACFR, Sydney", Instituto Tecnologico de Orizaba, Orizaba, Mexico, 23 October 2009.
19. "Field Robotics at ACFR, Sydney – Towards Reliable Perception for Autonomous Ground Vehicles", Centro de Investigacion en Matematicas (CIMAT), Guanajuato, Mexico, 19 October 2009.
20. "Towards Reliable Perception for Autonomous Ground Vehicles", Air Force Research Laboratory, Tyndall, FL, USA, 16 October 2009.
21. "Towards Reliable Perception for Autonomous Ground Vehicles", Robotics Institute, Carnegie Mellon University (CMU), Pittsburgh, PA, USA, 18 June 2009.
22. "Towards Reliable Perception for Autonomous Ground Vehicles", LAAS-CNRS, Toulouse, France, 9 June 2009.
23. "The ARC Centre for Autonomous Systems & Towards Reliable Perception for Autonomous Ground Vehicles", Institut des Systemes Intelligents et de Robotique (ISIR), University Pierre et Marie Curie, Paris, France, 5 June 2009.
24. "Autonomous UGV in Unknown Environments: Perception", Australian-Italian Robotics Workshop, University of New South Wales (UNSW), Sydney, Australia, 28 November 2008.
25. "The Unmanned Ground Vehicles at ACFR, The University of Sydney: Perception and Planning", LAAS-CNRS, Toulouse, France, 26 August 2008.
26. "Selection and control of navigation modes for an autonomous mobile robot in natural environments", Royal Institute of Technology (KTH), Stockholm, Sweden, 27 September 2007.
27. "Selection and control of navigation modes for an autonomous mobile robot in natural environments", Australian Centre for Field Robotics (ACFR), The University of Sydney, Sydney, Australia, 11 September 2007.

PRESENTATIONS OF PUBLICATIONS AT CONFERENCES AND WORKSHOPS

28. "Explicit 3D Change Detection Using Ray-Tracing in Spherical Coordinates" (poster, presented on behalf of J.P. Underwood), *IEEE International Conference on Robotics and Automation (ICRA)*, Karlsruhe, Germany, 9 May 2013.
29. "Learning Disturbances in Autonomous Excavation" (presented on behalf of G. Maeda), *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Vilamoura, Portugal, 9 October 2012.
30. "Mawson the Astrobiologist Rover: Towards Automatic Recognition of Stromatolites", *International Symposium on Artificial Intelligence, Robotics and Automation in Space (i-SAIRAS)*, Turin, Italy, 5 September 2012.
31. "Resilient Navigation through Probabilistic Modality Reconfiguration", *12th International Conference on Intelligent Autonomous Systems (IAS)*, Jeju Island, Korea, 29 June 2012.
32. "Autonomous Reconfiguration of a Multi-Modal Mobile Robot", *Workshop on Automated Diagnosis, Repair and Re-Configuration of Robot Systems, IEEE International Conference on Robotics and Automation (ICRA)*, Shanghai, China, 9 May 2011.
33. "Laser-Camera Discrepancies and Reliable Perception in Outdoor Robotics", *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Taipei, Taiwan, 20 October 2010.
34. "Visual Metrics for the Evaluation of Sensor Data Quality in Outdoor Perception", *Performance Metrics for Intelligent Systems Workshop (PerMIS),* Baltimore, MD, USA, 28 September 2010.
35. "Sensor Data Consistency Monitoring for the Prevention of Perceptual Failures in Outdoor Robotics", *Seventh IARP Workshop on Technical Challenges for Dependable Robots in Human Environments (DRHE)*, Toulouse, France, 16 June 2010.

36. "Towards Reliable Perception for Unmanned Ground Vehicles in Challenging Conditions", *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Saint Louis, MO, USA, 12 October 2009.

37. "Datasets for the Evaluation of Multi-Sensor Perception in Natural Environments with Challenging Conditions", *Workshop on Good Experimental Methodology in Robotics, Robotics: Science and Systems (RSS)*, Seattle, WA, USA, June 2009.

38. "A Probabilistic Framework to Monitor a Multi-Mode Outdoor Robot"*, IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS),* Edmonton, AB, Canada, August 2005.

39. "Enhanced Locomotion Control for a Planetary Rover"*, IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS),* Las Vegas, NV, USA, October 2003.