

The Resume of Dr Daniel Fitzgerald

Daniel Liam Fitzgerald

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EDUCATION

Tertiary

2003-2006 Doctor of Philosophy – Candidate Landing Site Selection for UAV Forced Landings using Machine Vision

Tertiary

1999-2002 Bachelor of Engineering – Aerospace Avionics, First Class Honours
Queensland University of Technology, Minor in Systems Engineering
GPA: 6.1

Secondary

1993-1998 Year 12 Senior Certificate - Villanova Secondary College
Overall Position (OP) – 1

Very High Achievements: Physics, Mathematics B, Mathematics C, Information Processing and Technology, Chemistry, English

AWARDS

2008 ICT Centre, CSIRO Go For Growth Divisional Award
2008 CSIRO-wide Go For Growth Award
2008 ICT Centre, Performance Cash Reward for work involved with the ARCAA UAV Outback Challenge (2007)
2007 ICT Centre, CSIRO OH&S Divisional Award
2007 CSIRO-wide OH&S award – special mention
2007 ICT 2006/2007 Performance Cash Reward
2007 CSIRO Recognition Award for participation at the ICT Centre Autonomous Systems Lab. Open Day
2002/3 QUT Postgraduate Research Award (2003-Feb 2006)
2002/3 Cooperative Research Centre for Satellite Systems Top Up Award (2003-2005)
2002/3 QUT Electronic and Electrical School of Engineering Faculty Top Up Award (2003-Feb 2006)
2002 Dean's Award for Ongoing Excellence in an undergraduate program
2002 2002 QUT Project Expo, Best Aerospace Project: 4 Engine VTOL Platform
2002 2nd place in the Royal Aeronautical Society Student Lecture Competition
2001 Dean's List for Academic Excellence (Faculty of Built Environment Engineering) Semester 2
1999 Dean's List for Academic Excellence (Faculty of Built Environment Engineering) Semester 1 and 2
1998 Attained 1st place in Mathematics B & C, Physics and Information Processing and Technology
1998 Attained the school's Silver Medal for Mathematics (awarded to the top student across all mathematics disciplines)
1998 Attained the school's award for Music, awarded to the student who has contributed not only through participation in the school's music program throughout the high-school years, but also through leadership at the numerous events.

WORK HISTORY

July 2010 Director of Sales and Marketing – UAV Vision

As mentioned below in the entry under AeroSys Pty Ltd, I am now acting in the capacity of Sales and Marketing Director for UAV Vision. I have had significant experience with the products that are being sold, as I have been involved with the development of the camera gimbal systems since the beginning in around 2006. The stabilised camera systems are now a full production system, and the company is actively selling these products around the globe in addition to a full range of accessories that provides complete solution for UAVs, manned aircraft and other vehicles such as ground vehicles are marine vessels.

For more information visit: www.uavvision.com

2010 Project / Operations Manager – Australian Research Centre for Aerospace Automation

Short term appointment with the group that I was formally a part of upon returning to Brisbane for family reasons. I worked in this role for approximately 4 months, before moving to work in my own company full time in June 2010. Refer separate entry below (AeroSys Pty Ltd).

In my role here I was in charge of a multi-million dollar project that involved the development of an autonomous system for a manned aircraft to guide the aeroplane precisely above powerlines for data capture. The system prototype was proven and the project is currently in a commercialisation stage, with the rollout of this, the largest power line data capture in the world scheduled for 2011.

2009-2010 Head of Avionics Research & Development, Senior Aerospace Avionics Engineer, Cyber Technology WA

Full time permanent role as the head of all avionics research and development for the company. Through my time here, I built up a specialist team of Mechatronics engineers, computer science specialists and other university students. The team I managed was approximately 10 people.

The specifics of the role was to head up the in-house development of the complete avionics system onboard the UAV aircraft (autopilot, power systems, engine management, communications), as well as all ground control systems to interface to the UAV (user interfaces, configuration, flight control, communications). This included the complete specification of the entire project – project management plan (budgets, timelines and personnel), presentations for securing funding for the project, hiring and managing personnel, and the specification, design and flight testing phases of the project. The project is ongoing.

Other duties included writing reports for the company to gain R&D tax refunds equating to hundreds of thousands of dollars per year.

2006-2008 CSIRO Research Scientist, Aerial Robotics Group, Autonomous Systems Laboratory, ICT Centre, CSIRO

Full time employment as a research scientist. The main objective of the project I was involved with was to develop a dependable mini helicopter system for civilian inspection and search tasks close to obstacles. These operations are to be performed by one operator, beyond line of sight, in common airspace and in typical Queensland weather conditions.

Typical inspection and search task applications include: Power line inspection; Structural inspection (eg: cooling tower inspection); and Disaster assessment and search of victims.

Incorporating dependable autonomous on-board subsystems with suitable perception and control capabilities reduces the number of operators, relaxes the requirements on communication links, and enables to fly safely in common airspace. The CSIRO helicopter system will enable future missions to be more effective and efficient.

Duties here involved autonomous hardware and software development for the UAV helicopter, vision tracking algorithms, development of a complete ground operation station, flight testing, flight testing regulations, OH&S policies etc.

2006 **ARCAA Project Officer, Autonomous Systems Laboratory, ICT Centre, CSIRO**
Casual work for the group involving various activities for the new Australian Research Centre for Aerospace Automation (ARCAA) and aerial robotics work for the new Dependability in Field Robotics project.

2003-2006 **Postgraduate Research at Queensland University of Technology**
Candidate Landing Site Selection for UAV Forced Landings using Machine Vision

2004-2005 **Lecturing – Queensland University of Technology**
Electrical Engineering Design 1 (EEB584 – 3rd Year)

2002-2005 **Tutoring – Queensland University of Technology**
Tutored a number of subjects throughout the course of my studies including: Analogue and Digital Electronics; Industrial Electronics and Digital Design, Electrical Engineering and Design 1; Navigation Systems for Aircraft and Space, to name a few.

2003-Current **AeroSys Pty Ltd Director**
I am the sole director of this company that has been operating since 2003. The main purpose of the company has been to develop and promote an aircraft maintenance program. This system is in use by a number of Australian aircraft maintenance companies and continues to grow. There has also been discussions with some overseas distributors to promote the product into the large US general aviation market.

The main focus of the company now is on the sales and marketing of stabilised camera gimbal systems that have been developed in partnership with UAV Vision (www.uavvision.com)

Position & Responsibilities

- Company Director
- Software Engineer – significant C#.NET experience, SQL & XML database programming
- Website Design and Administration – significant html, PHP and java experience
- Public Relations
- Marketing
- Business
- Accounting

Feb-Mar 2005 **Contract Work for John Deere Limited**

Job Description

- Concept and development of a website for New Zealand John Deere dealers to upload used equipment for sale

- A publisher could then log on and gather all items for sale to produce a used equipment for sale magazine
- Systems engineering practises, website development – html, php, java, database development - MySQL

Nov 2002-05 **Contract Work for Aircraft Engineers and Associates Pty Ltd**

Skills attained / responsibilities

- The contract was to rewrite the entire software maintenance system
- Research into the existing system and commercial regulations was conducted
- Regular consultations were held with the customer to write the software specifically to their needs
- Significant knowledge of Microsoft Visual Studio.NET, including XML databases and Crystal Reports
- The software – *Aircraft Maintenance Scheduler* – was released commercially early 2005

MEMBERSHIPS

- AUVS Australia Committee Member 2010-
- AIAA Student Member (2005, 2006)
- Golden Key National Honour Society (1999-Present)
- Institute of Engineers Australia (2000-2004), Graduate Member
- Royal Australian Aeronautical Society (2002-2004), Associate Member

PUBLICATIONS

JOURNALS / REFEREED

- Eng, Pillar C. Mejias, Luis O. Walker, Rodney A. and Fitzgerald, Daniel L., “*Guided Chaos – Path Planning and Control for a UAV Forced Landing*”, IEEE Robotics and Automation Magazine, July 2010
- Fitzgerald, Daniel L. and Mejias, Luis O. and Eng, Pillar C., “*Semi-Automated Design of a Surface Classifier for a UAV Forced Landing Application*” (submitted)

CONFERENCES:

- Fitzgerald, Daniel L. and Mejias, Luis O. and Eng, Pillar C. and Liu, Xi and Walker, Rodney A. “*Towards Flight Trials for an Autonomous UAV Emergency Landing using Machine Vision*”, In Proceedings Australasian Conference on Robotics and Automation, Brisbane, 2007
- Eng, Pillar C, Fitzgerald, Daniel L., Mejias, Luis O. and Walker, Rodney A. “*Simulation of a Fixed-wing UAV Forced Landing with Dynamic Path Planning*”, In Proceedings Australasian Conference on Robotics and Automation, Brisbane, 2007
- Fitzgerald D., Walker R., Campbell D., “*A Vision Based Forced Landing Site Selection System for an Autonomous UAV*”, 2005 IEEE International Conference on Intelligent Sensors, Sensor Networks and Information Processing (ISSNIP), Page(s): 397-402, 2005
- Fitzgerald D., Walker R., “*Classification of Candidate Landing Sites for UAV Forced Landings*”, 2005 AIAA Guidance, Navigation, and Control Conference and Exhibit; San Francisco, CA; USA; 15-18 Aug. 2005. pp. 1-13. 2005
- Fitzgerald D., Walker R., Campbell D., “*A Computationally Intelligent Framework for UAV Forced Landings*”, Proceedings of the IASTED International Conference on Computational Intelligence, pp. 187-192, 2005
- Fitzgerald D., Walker R., Campbell D., “*A Vision Based Emergency Forced Landing System for an Autonomous UAV*”, Australian International Aerospace Congress Conference, Melbourne Australia, March 2005
- Duggan, A.¹, Walker, R., Dusha, D., Fitzgerald, D., “*Automated TUAV Launch and Recovery Zone ID System*”, Australian International Aerospace Congress Conference, Melbourne Australia, March 2005

¹ Co-authored with Boeing Australia

- Walker, R., McManus, I., Wang, C., Fitzgerald, D., “*Robust Avionics Systems for Highly Automated UAV Missions*”, Proceedings of the UAV-MMNT03 French - Australian Advanced Workshop on Multidisciplinary Methods and Numerical Tools for UAV Design Applications, Sydney, July 14-16, 2003. (Invited)

TECHNICAL REPORTS:

- Fitzgerald D., “*Official Rules Document for the ARCAA UAV Outback Challenge 2007*”, CSIRO internal technical report, April 2007
- “*Aerial Robotics Project Risk Management Document*”, CSIRO internal technical report, October 2006. Supporting documentation:
 - Plant Risk Assessment (RA)
 - Occupational Hygiene RA
 - Environmental RA
 - Time RA
 - Financial RA
 - Design RA
 - Maintenance RA
 - Manufacture RA
 - Operations RA
- “*UAV Operations: Site Preparation and Safety Document*”, CSIRO internal technical report, October 2006.
- “*Mission Operation and Plan Document*”, CSIRO internal technical report, October 2006. Supporting documentation:
 - Mission Operation and Plan Worksheets
 - Flight Logs
 - Servicing Log
 - Permissible Unservicability Log
 - Documentation provided by the helicopter supplier – startup, shutdown and battery charging procedures
- Walker R., Roberts, P., Fitzgerald D., Wang C., “*En-Route Human Pilot Automation Considerations for Future UAV Systems*”, Consulting Report to DSTO's Air Vehicles Division, 2005/6
- Walker, R., McManus, I., Fitzgerald, D., Cork, L., Carnie, R., “*Issues Associated with Agent Control in UAV Applications*”, Consulting Report to DSTO's Air Vehicles Division, May 2004

CONFERENCES / WORKSHOPS ATTENDED:

- October 2009, *Invited Speaker*, AUVs Enhanced Acquisition and Intervention - Nearshore to Deep Ocean (Perth, Australia)
- July 2008, ARCAA Smart Skies project workshop 1 week workshop (Denver, USA)
- April 2008, ARCAA Smart Skies project workshop 1 week workshop (Seattle, USA)
- Feb 2008, ARCAA Smart Skies project workshop 1 week workshop (Brisbane, Australia)
- 2007 ARCAA Police Workshop, QUT, Gardens Point
- 2007 Australian International Airshow (Avalon, Australia)
- RaeS Brisbane Branch Dinner – Speaker: Crawford Hamilton, Pacific Airbus (November 2006)
- October 2006, Aviation High School Visit, QUT, Gardens Point – Presented an overview of the powerline inspection project with Torsten Merz and Stefan Hrabar
- 2006 CSIRO ICT Conference, Sydney, Australia
- 2006 ARCAA Workshop – Emerging Standards, Regulations and Operational Experiences (Queensland University of Technology, Brisbane Australia)
- 2005 CSIRO ICT Conference, Sydney, Australia
- 2005 AIAA Guidance, Navigation, and Control Conference and Exhibit; San Francisco, CA; USA
- 2005 ARCAA Workshop – Challenges and Applications in the Asia Pacific Region (Queensland University of Technology, Brisbane Australia)
- 2005 IEEE International Conference on Intelligent Sensors, Sensor Networks and Information Processing (ISSNIP)

- Australian International Airshow (Avalon, Australia) – Trade Show Exhibiter
- Insect Sensors and Robotics Conference, August 2004, Brisbane, Australia
- Australian International Aerospace Congress (AIAC) Conference, March 2003, Brisbane, Australia
- Cooperative Research Centre for Satellite Systems (CRCSS) Annual Conference, February 2003, Adelaide, Australia

REVIEWING

I have reviewed papers for the following publications:

- ICRA 2007 (1 review)
- FSR 2007 (2 reviews)

COLLABORATION

- Invited judge for the ARCAA UAV Outback Challenge 2010
- Cyber Technology partnering with a number of commercial West Australian companies for different civilian applications – shark patrol, maritime monitoring, surveillance, offshore inspections, mining / surveying
- ARCAA – a collaboration between CSIRO and QUT to further the research and technology for integrating UAVs into civilian airspace
- Smart Skies Project – a collaboration between Boeing Phantom Works, Boeing Australia, CSIRO and QUT.
- UAV Vision – collaboration with this company to develop a new range of camera gimbal systems for manned and UAV platforms and well as on boats and other applications. (<http://www.uavvision.com/products/gimbals.html>)

OTHER COMPLETED COURSES

- Fire Extinguisher course, 2007
- Senior First Aid Certificate (Valid for 2007-2010)
- 6 Degrees of Freedom Modelling and Simulation of Aerospace Vehicles, Mawson Lakes, SA, Australia, October 2006
- CSIRO ICT Centre Early Career Researcher (ERC) Introduction program, November 2006, Brisbane, Australia
- Fire safety course, conducted by the school of Electrical and Electronic Computer Systems (EESE) at QUT, 2003

EXTRA CURRICULAR ACTIVITIES

Extra curricular activities that I am involved in include:

- Electronics & Computer programming
- Model Planes (R/C)
- Hockey
- Piano (GRADE 6 AMEB – Prac; GRADE 4 AMEB – Theory), guitar and vocals

REFEREES

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