

MARK HEDLEY JONES

Professional autonomous mobile robotics R&D engineer (6+ years)
Holds Bachelor's, Masters, and Doctoral degrees (science & engineering)
Experience living & working internationally (Japan & New Zealand)



Nationality:	New Zealand
Date of birth:	October 1984
Language:	English (Fluent), Japanese (N4)

SKILLS

Technical:

- Experience developing **ROS** based robotic systems across four multi-million dollar projects (6+ years)
- Implementation of computer vision systems (**OpenCV & Deep Learning**) for real-time identification
- Designing mechanical components and modeling using CAD tools (**SolidWorks**, 6+ years)
- Software development in **Linux** (10+ years) with **C/C++** (6+ years), and **Python** (8+ years)
- Electronic design (PCB/embedded) and including fail-safe system architecture

Communication:

- Managing a small research team (6-10 people) and presenting progress at board meetings
- Publishing research papers, presenting at international conferences, and writing theses
- Mentoring post-graduate students and demonstrating in undergraduate laboratories

Miscellaneous:

- Financial management of project spending with direct control of company credit cards
- Workshop competency including use of mills (manual & CNC), lathes, MIG welder

EMPLOYMENT

Software Engineer - Mapping & Simulation Systems

SEQSENSE

November 2018 – Present

Developing and maintaining a 3D map generation system that runs across desktop, cloud, and our robot (real-time).
Tasks include:

- improving **LiDAR** based map generation by: increasing map fidelity, and reducing resource usage;
- documentation of system architecture (in English) including creation of system architecture maps;
- building and maintaining a simulation environment (**Gazebo**) that closely mimics robot behaviour;
- producing and maintaining accurate robot model definitions (**URDF**) from CAD models.

Post-Doctoral Researcher - Autonomous Navigation

Robotics Plus Ltd., employed by The University of Auckland.

December 2017 – October 2018

Developed navigation software for heavy-duty vehicles used in outdoor environments.

Tasks included:

- integrating and tuning real-time **SLAM**, point-cloud processing, and path-planning in orchards;
- selecting and integrating lidar, cameras, radars, compasses, encoders, IMUs, and GNSS systems;
- personally responsible for the safety of people and infrastructure regarding our autonomous vehicle;
- development of a web-based graphical user interface to monitor and control our autonomous vehicle.

Post-Doctoral Researcher - Robotic Hardware Development

Robotics Plus Ltd., employed by The University of Waikato.

March 2015 – December 2017

Designed and built a heavy-duty outdoor vehicle, fruit harvesting robot, pollination robot.

Designed robotic systems (hardware & firmware) and managed a team of post-graduate researchers.

Tasks included:

- financial management, ordering, report writing, project planning, and resource coordination;
- component selection, vehicle design and assembly, electrical hardware integration and testing.
- managing a research team consisting of doctoral and masters students, coordinating between universities;
- developing **ROS** based systems to control robotic arms, precision spraying systems, and an electric vehicle;

Previously:

Web Developer Department of Science & Engineering (The University of Waikato)

2013 – 2014

Developed an interactive tutorial web-app used by all 1st year electronic engineering students. ([More](#))

Lab Demonstrator Department of Science & Engineering (The University of Waikato)

2013 – 2014

Managed electronics laboratories, demonstrated electronic concepts, and graded assignments and final exams.

Web Developer Self-employed

2010 – 2013

Built an online rental-property advertising company. Sourced investment, developed partnerships, marketing. ([More](#))

Researcher Department of Biological Science (The University of Waikato)

2010

Created electric field simulations of an electro-fishing boat to improve its ability to catch pest fish species. ([More](#))

Audio/Visual installation 021SOUNDTECH

2006 – 2007

Traveled across New Zealand installing high-end audio equipment into under-construction public venues.

Assembly Technician [RENNACS](#)

2005 – 2006

Assembled, soldered, flashed, tested, and debugged automotive fault-code readers.

Further back:

Owned and operated a property-maintenance business; worked on a sheep farm; restored old houses; printed photos for a mail-order photo processing lab; worked in a supermarket delicatessen; made pizzas at Pizza Hut; cleaned swimming pools for a pool company; photo-cataloging high-voltage electrical substation equipment; painting tapestry canvases; computer assembly, repairs & maintenance.

EDUCATION

- **Doctorate of Philosophy** – The Electrical Properties of Interfacial Double Layers 2011 – 2015
 - Modelled electrical conductivity of implanted medical electrodes using circuit simulation tools
 - Conducted automated electrical impedance measurements *in a hospital operating theatre*
 - Developed software libraries to automate oscilloscopes and function generators
- **Masters of Engineering** with First Class Honours 2009
 - Simulated a novel design of high-frequency power sensor (170 GHz) to determine performance
 - Built and measured the performance of scale models of RF sensors to verify simulation results
 - Visited NIST, Boulder Colorado, to find understand sensor traceability testing at the US national level
- **Bachelor of Science** – Major in Electronics focusing on Mechatronics 2005 – 2008

AWARDS & SCHOLARSHIPS

• Waikato Doctoral Scholarship	\$ 56 000 USD	2010
• Agilent Technologies Research Scholarship	\$ 36 000 USD	2009
• Summer Research Scholarship	\$ 5 000 USD	2008
• ENZcon – best research paper		2011
• ENZcon – runner up best presentation		2014

PHILOSOPHY

Something isn't right just because other people are doing it - sometimes they're all wrong

The ability to teach yourself is more valuable than your degrees

Test ideas early and invest time in reducing the cost to re-test

Truly novel solutions require creativity, not experience

PUBLICATIONS

Please see [my website](#) for an up-to-date list of publications.

REFEREES

Available upon request