

AARON MARBURG

Senior Research Engineer

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Education

- 2015 **University of Canterbury, Christchurch, New Zealand**
PhD, Electrical and Computer Engineering
Thesis: *Towards Persistent Navigation with a Downward-Looking Camera*
Advisor: Dr. Michael P. Hayes
- 2004 **Stanford University, Palo Alto, California**
MS, Aeronautical and Astronautical Engineering
- 1998 **Swarthmore College, Swarthmore, Pennsylvania**
BS, Honors Major of Engineering (Highest Honors)
Minor in Peace and Conflict Studies

Appointments

- 2016–Present **Senior Research Engineer**, Applied Physics Laboratory,
University of Washington (UW-APL), Seattle, WA.
- 2015–2016 **Postdoctoral Researcher**, UW-APL.
- 2009–2014 **Research Associate**, Wireless Engineering Centre (WRC) and Spatial
Engineering Research Centre (SERC),
University of Canterbury, Christchurch, New Zealand.
- 2007–2009 **Research Engineer**, Geospatial Research Center NZ (GRCNZ) Ltd.,
Christchurch, New Zealand.
- 2006–2007 **Research Engineer**, Monterey Bay Aquarium Research Institute
(MBARI), Moss Landing, CA.
- 2004–2005 **Data Warehouse Administrator**, IceCube Project,
University of Wisconsin, Madison, WI.
- 2000–2003 **Senior Engineer**, Bluefin Robotics, Cambridge, MA.
- 1997–2000 **Engineer**, Autonomous Underwater Vehicle Laboratory (AUV Lab),
Sea Grant College Program, Massachusetts Institute of Technology,
Cambridge, MA.

Products

- A. Marburg**. “A Low-Cost, Self-Contained Underwater Stereo Camera for Realtime 3D Reconstruction.” *Proc. IEEE/MTS OCEANS 2016* Monterey, 2016.
- A. Marburg**, K. Bigham. “Deep Learning for Benthic Fauna Identification.” *Proc. IEEE/MTS OCEANS 2016* Monterey, 2016.
- F. Knuth, L. Belabassi, L. Garzio, M. Smith, M. Vardaro, **A. Marburg**. “Automated QA/QC and Time Series Analysis on OOI High-Definition Video Data.” *Proc. IEEE/MTS OCEANS 2016* Monterey, 2016.

Delaney et al., “Axial Seamount - wired and restless: A cabled submarine network enables real-time, tracking of a Mid-Ocean Ridge eruption and live video of an active hydrothermal system Juan de Fuca Ridge, NE Pacific.” *Proc. IEEE/MTS OCEANS 2016* Monterey, 2016.

A. Marburg, A. Stewart. “Extrinsic Calibration of an RGB Camera to a 3D Imaging Sonar.” *Proc. IEEE/MTS OCEANS Conf. Exhib.* Washington D.C., 2015. Accepted.

A. Marburg, M. Hayes. “SMARTPIG: Simultaneous mosaicking and resectioning through planar image graphs.” *Robotics and Automation (ICRA), 2015 IEEE Int. Conf. on.* Seattle, 2015. DOI: <http://dx.doi.org/10.1109/ICRA.2015.7140007>

A. Marburg, M. Hayes. “Pose Guided Matching for Aerial Images” *Proc. 29th Int. Conf. on Image and Vision Computing New Zealand (IVCNZ '14)*. Hamilton, New Zealand, 2014. DOI: <http://dx.doi.org/10.1145/2683405.2683410>

A. Marburg, M. Hayes and A. Bainbridge-Smith. “A machine vision extension to the Ruby programming language using OpenCV and FFI.” *Proc. 28th Int. Conf. on Image and Vision Computing New Zealand (IVCNZ '13)*. Wellington, New Zealand, 2013. DOI: <http://dx.doi.org/10.1109/ivcnz.2013.6727013>

A. Marburg, M. Hayes and A. Bainbridge-Smith. “Pose priors for aerial image registration.” *Proc. Digital Image Computing Techniques and Applications 2013 (DICTA '13)*. Hobart, Tasmania, 2013. DOI: <http://dx.doi.org/10.1109/dicta.2013.6691515>

A. Marburg, M. Hayes and A. Bainbridge-Smith. “Evaluation of feature detectors for registering aerial images.” *Proc. 27th Int. Conf. on Image and Vision Computing New Zealand (IVCNZ '12)*. Dunedin, New Zealand, 2012. DOI: <http://dx.doi.org/10.1145/2425836.2425877>

W.H. Wang, X.Q. Chen, **A. Marburg**, J.G. Chase, C.E. Hann. “Design of Low-Cost Unmanned Underwater Vehicle for Shallow Waters.” *Int. J. of Advanced Mechatronic Systems*. Vol 1, Num 3, pp 194–202. 2009.

Q. Ou, X.Q. Chen, D. Park, **A. Marburg**, J. Pinchin. “Integrated Flight Dynamics Modelling for Unmanned Aerial Vehicles.” *IEEE Mechatronic and Embedded Systems and Applications*. pp 570–575. 2008. DOI: <http://dx.doi.org/10.1109/mesa.2008.4735660>

D.R. Wong, Q. Ou, M. Sinclair, Y.J. Li, X.Q. Chen, **A. Marburg**. “Unmanned Aerial Vehicle Flight Model Validation Using On-Board Sensing and Instrumentation.” *IEEE Mechatronics and Machine Vision in Practice (M2VIP) 2008*. pp 119–114. 2008. DOI: [10.1109/MMVIP.2008.4749516](http://dx.doi.org/10.1109/MMVIP.2008.4749516)

W.H. Wang, X.Q. Chen, **A. Marburg**, J.G. Chase, and C.E. Hann. “A Low-Cost Unmanned Underwater Vehicle Prototype for Shallow Water Tasks” *2008 IEEE/ASME Intl. Conf. on Mechatronic and Embedded Systems and Applications*. DOI: <http://dx.doi.org/10.1109/mesa.2008.4735649>

A. Marburg (as Aaron Marsh). “The Battlespace Preparation Autonomous Underwater Vehicle: An Organic Mine-Hunting System.” *Autonomous Unmanned Vehicles Systems International Conference (AUVSI)*. Baltimore, Maryland, 2003.

Other Presentations

Invited Speaker: Monterey Bay Aquarium Research Institute, Blink-UX Knowledge Share, Christchurch Ruby Users Group

Invited Panelist: 2016 IOOS Advisory Panel, 2016 Global Maritime Forum

Reports Prepared Under Contract

A. Marburg. “A Network Simulator for Forensic Collaboration.” Wireless Research Centre (WRC), Christchurch, New Zealand, 2013. Prepared under contract to Environmental Science and Research (ESR).

A. Marburg. “Communication Network Architecture for ESR Wireless Cameras to Support Remote Collaboration.” Wireless Research Centre (WRC), Christchurch, New Zealand, 2013. Prepared under contract to Environmental Science and Research (ESR).

A. Marburg. “Applications of Unmanned Aerial Vehicles for Rural Firefighting.” Spatial Engineering Research Centre (SERC), Christchurch, New Zealand, 2012. Prepared under contract to Scion.

A. Marburg, J. Brown, M. Thomas. “Low-Cost Airborne Thermal Sensors for Animal Monitoring.” Geospatial Research Centre (GRC), Christchurch, New Zealand, 2008. Brian Mason Scientific & Technical Trust Grant number 2007/18.

Honors and Awards

2017	UW eScience Winter Incubator
2015	UW-APL SEED Postdoctoral Fellowship
2010	University of Canterbury Doctoral Scholarship
2003	Lockheed Corporation Robert E. Gross Fellowship, Stanford University
1998	Thomas McCabe Award for top engineer in senior class, Swarthmore College
1997	John W. Perdue Memorial Prize for top engineer in junior class, Swarthmore College

Professional Affiliations

Sigma Xi

IEEE Member: Ocean Engineering Society (OES), Robotics and Automation Society (RAS)

Marine Technology Society (MTS)

Work Status

I am a US citizen and a permanent resident of New Zealand with right of indefinite return. I can legally be employed without restriction in both the US and New Zealand.