

Morgan Quigley

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EDUCATION

Ph.D. Computer Science, Stanford University (2012)

- Advisor: Dr. Andrew Ng, Artificial Intelligence Laboratory
 - Dissertation title: Hardware and Software Systems for Personal Robots
- B.S. Computer Science and B.A. Music, Brigham Young University (2005)

WORK

Open Source Robotics Foundation (2012-present)

- Heterogeneous embedded systems (FPGA+MCU's, etc.)
- Design and implementation of dense mechatronic systems (hands, etc.)
- High-performance brushless motor controller design and implementation

Artificial Intelligence Laboratory, Stanford University (2005-2012)

- A co-founder of the Robot Operating System (<http://ros.org>), currently the most popular open-source robot software system in the research community
- Design and rapid prototyping of low-cost robot arms and hands
- Depth-sensor and SDR GPS receiver design and prototyping

Machine Intelligence Laboratory, Brigham Young University (2002-2005)

- Autopilot software and middleware for micro-UAVs
- Target acquisition and tracking using small airborne cameras

Consulting (2002-2012)

- UHF software-defined radio (SDR) design and prototyping
- Embedded system design and high density layouts
- Verilog FPGA and CPLD designs
- Firmware design for ARM and Atmel AVR
- Android and iPhone apps

AWARDS

- MIT Technology Review "35 under 35", 2013
- NDSEG fellowship: 2005-2009
- Goldwater scholarship: 2004-2005
- Full undergraduate scholarship: 2002-2004

TECHNICAL

- Coding: C, C++, Verilog, Ruby, Python, MATLAB, many others more slowly
- Embedded: FPGA and ARM, various microcontrollers, etc.
- Electrical: digital and analog design, layout, prototyping, bench skills, etc.
- Graphical toolkits: Qt, wxWidgets, Android, iPhone, OpenGL, etc.
- ***I use Linux and open-source toolchains whenever possible***

Publications

- A. Mazumdar, S. Spencer, C. Hobart, J. Salton, M. Quigley, T. Wu, S. Bertrand, J. Pratt, S. Buerger, **Parallel Elastic Elements Improve Energy Efficiency on the STEPPR Bipedal Walking Robot**, IEEE/ASME Transactions on Mechatronics, 23 November 2016.
- M. Quigley, B. Gerkey, W.D. Smart, **Programming Robots with ROS**. O'Reilly & Associates, 2015
- A. Mazumdar, S. Spencer, C. Hobart, K. Dullea, M. Kuehl, T. Blada, J. Love, M. Quigley, J. Smith, S. Bertrand, T. Wu, J. Pratt, S. Buerger, **Using Parallel Stiffness to Achieve Improved Locomotive Efficiency with the Sandia STEPPR Robot**, in *Proc. International Conference on Robotics and Automation (ICRA)*, 2015
- M. Quigley, C. Salisbury, A. Y. Ng, J. K. Salisbury, **"Mechatronic Design of an Integrated Robotic Hand,"** in the International Journal of Robotics Research (IJRR), Volume 33, 5 April 2014, pp. 706-720
- L. S. Lincoln, M. Quigley, B. Rohrer, C. Salisbury, and J. Wheeler, **"An Optical 3D Force Sensor for Biomedical Devices,"** in IEEE RAS/EMBS International Conference on Biomedical Robotics and Biomechatronics, Rome, Italy. June 24-27, 2012.
- M. Quigley, **Hardware and Software Systems for Personal Robotics**, Dissertation, Stanford University Computer Science Department, 2012.
- M. Quigley, A. Asbeck, and A. Y. Ng, **"A Low-cost Compliant 7-DOF Robotic Manipulator,"** in *Proc. International Conference on Robotics and Automation (ICRA)*, 2011.
- J. Huang, D. Millman, M. Quigley, D. Stavens, S. Thrun, and A. Aggarwal, **"Efficient Generalized Indoor WiFi GraphSLAM,"** in *Proc. International Conference on Robotics and Automation (ICRA)*, 2011
- D. Rao, Q. V. Le, T. Phoka, M. Quigley, A. Sudsang, and A. Y. Ng, **"Grasping Novel Objects with Depth Segmentation,"** in *Proc. IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2010.
- M. Quigley, D. Stavens, A. Coates, and S. Thrun, **"Sub-meter Indoor Localization in Unmodified Environments with Inexpensive Sensors,"** in *Proc. IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2010.
- M. Quigley, R. Brewer, S. P. Soudararaj, V. Pradeep, Q. Le, and A. Y. Ng, **"Low-cost Accelerometers for Robotic Manipulator Perception,"** in *Proc. IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2010.
- S. Gleason, M. Quigley, and P. Abbeel, **"An Open Source AGPS/DGPS Capable C-coded Software Receiver,"** in *Proc. Institute of Navigation, Savannah, GA*, 2009.
- M. Quigley, B. Gerkey, K. Conley, J. Faust, T. Foote, J. Leibs, E. Berger, R. Wheeler, and A. Y. Ng, **"ROS: an open-source Robot Operating System,"** in *Proc. Open-Source Software workshop of the International Conference on Robotics and Automation (ICRA)*, 2009.
- M. Quigley, S. Batra, S. Gould, E. Klingbeil, Q. Le, A. Wellman, and A. Y. Ng, **"High-Accuracy 3D Sensing for Mobile Manipulation: Improving Object Detection and Door Opening,"** in *Proc. International Conference on Robotics and Automation (ICRA)*, 2009.
- S. Gould, P. Baumstarck, M. Quigley, A. Y. Ng, and D. Koller, **"Integrating visual and range data for robotic object detection,"** in *Proc. European Conference on Computer Vision (ECCV) workshop on Multi-camera and Multi-modal Sensor Fusion Algorithms and Applications (M2SFA2)*, 2008.
- A. Saxena, L. Wong, M. Quigley, and A. Y. Ng, **"A vision-based system for grasping novel objects in cluttered environments,"** in *Proc. International Symposium on Robotics Research (ISRR)*, 2007.
- M. Quigley, E. Berger, and A. Y. Ng, **"STAIR: Hardware and Software Architecture,"** in *Proc. AAAI Robotics Workshop*, 2007.
- M. Quigley, P. Abbeel, D. D. S. Lorenzo, Y. Gu, S. Bolouki, D. Akos, and A. Y. Ng, **"Portable GNSS Baseband Logging,"** in *Proc. Institute of Navigation (ION) 2007 GNSS Conference*, 2007.
- P. Abbeel, A. Coates, M. Quigley, and A. Y. Ng, **"An application of reinforcement learning to aerobatic helicopter flight,"** in *Proc. Neural Information Processing Systems Conference (NIPS)*, 2006.
- P. Abbeel, M. Quigley, and A. Y. Ng, **"Using inaccurate models in reinforcement learning,"** in *Proc. Internal Conference on Machine Learning (ICML)*, 2006.
- M. A. Goodrich, B. S. Morse, D. Gerhardt, J. L. Cooper, M. Quigley, J. A. Adams, and C. Humphrey, **"Supporting Wilderness Search and Rescue using a Camera-Equipped Mini UAV,"** *Journal of Field Robotics*, vol. 25, pp. 89-110, 2008.
- M. Quigley, B. Barber, and M. A. Goodrich, **"Towards Real-World Searching with Fixed-Wing Mini-UAVs,"** in *Proc. IEEE International Conference on Intelligent Robots and Systems (IROS)*, 2005.
- M. Quigley, M. A. Goodrich, S. Griffiths, A. Eldredge, and R. Beard, **"Target Acquisition, Localization, and Surveillance using a Fixed-Wing Mini-UAV and Gimbaled Camera,"** in *Proc. IEEE International Conference on Robotics and Automation (ICRA)*, 2005.
- M. A. Goodrich and M. Quigley, **"Satisficing Q-Learning: Efficient in Problems with Dichotomous Attributes,"** in *Proc. International Conference on Machine Learning and Applications (ICML-A)*, 2004.
- S. Ricks and M. Quigley, **"A Pragmatic Approach to Set-Based Algorithmic Composition,"** in *Proc. 2004 International Computer Music Conference*, 2004.
- M. A. Goodrich and M. Quigley, **"Learning Haptic Feedback for Guiding Driver Behavior,"** in *Proc. IEEE*

- Conference on Systems, Man, and Cybernetics*, 2004.
- M. Quigley, M. A. Goodrich, and R. W. Beard, "**Semi-Autonomous Human-UAV Interfaces for Fixed-Wing Mini-UAVs**," in *Proc. IROS*, 2004.