

Alexander Long

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JOURNAL ARTICLES

“Humanoids learn touch modalities identification via multi-modal robotic skin and robust tactile descriptors”, Mohsen Kaboli, **Alexander Long**, Gordon Cheng, *Advanced Robotics*, vol. 29, no. 21, pp. 1411–1425, Nov 2015

EDUCATION

Master of Science, Technische Universität München*

Elektrotechnik und Informationstechnik

March 2016

GPA 1.4 – *Sehr gut bestanden (Very well passed)*

Master of Engineering, University of Queensland*

Electrical Engineering

March 2016

GPA 6.75/7 – *Honors class I and top 10 in graduating class*

Bachelor of Engineering, University of Queensland

Electrical Engineering

November 2013

GPA 6.27/7 – *Honors class I*

*Completed concurrently as first student in flagship double-degree program

PROFESSIONAL EXPERIENCE

Institute for Cognitive Systems

Research Internship, Munich

May – Oct 2015

- Completed literature review of Machine Learning and tactile sensing for social touch recognition in humanoid robots.
- Co-authored journal article, developing and applying novel feature extraction methods to the problem.
- Authored a project proposal for tactile object recognition via a robotic arm and Reinforcement Learning based action selection.
- Developed and implemented a genetic algorithm based method to automatically engineer features in high-dimensionality, low-sample data.

J. W. Shannon

Electrical Engineering Internship, Brisbane

Nov 2012 – March 2013

- Lead the implementation and testing of a specialized embedded system to be used for industrial communication. An EtherCAT protocol was deployed, targeting ARM Cortex A8 processors, and used in a novel sensor designed to detect stress microfractures in large steel bodies.
- Completed a range of AS3000 standards-based verification tasks for ZPMC cranes to be installed in the Sydney international crane terminal.
- Developed a Power-over-Ethernet system capable of meeting power requirements greater than those available from existing standardized systems.

Center for Educational Innovation and Technology

Software Engineering Internship, Brisbane

Nov 2011 – March 2012

- Collaboratively planned and implemented a Drupal based web service to assess the basic knowledge level of incoming first year engineers to UQ and disseminate feedback reports to all appropriate stakeholders.

Vuly Trampolines

Web and Graphic Design, Brisbane

March – June 2011

- Worked as part of the initial two person site-design team part time during first-year university.
- Liaised with the product manager and photographers to best bring the product into an online setting.
- The base architecture still remains, and currently processes several million dollars of orders per year.

SELECTED HONORS

Dean's Commendation for Academic Excellence	2010 – 2015
EAIT Faculty scholarship for overseas study	2014
Bannockburn Special Certificate for community involvement	2013
Emmanuel College 2nd year prize for outstanding academic achievement	2013
Emmanuel College 1st year prize for outstanding academic achievement	2012
RWH Hawken Scholar	2011
UQ Excellence scholarship	2010

CO-CURRICULAR ACTIVITIES

Technische Universität München

Tandem English Volunteer Tutor September 2014

- Organized and completed weekly one-on-one meetings with assigned student focusing on grammar and enunciation at B2 level.

STERN Program - Chryosphere Project

Student Contributor May 2014

- Contributed to work on the STERN rocket, a hybrid rocket designed to set the European student altitude record.
- Assisted in the design and modeling of an inverted-F antenna to stream HD video from the rocket.
- Worked effectively in a cross-discipline environment with a team of twelve mechanical engineers.

Emmanuel College

Community Service Coordinator March 2011 – March 2012

- Member of college executive, responsible for motivating students towards making a positive community contribution, and facilitating opportunities to do so.
- Liaised with larger voluntary organizations to coordinate events such as Cleanup Australia Day.
- Led a drive for funds to support students affected by the Brisbane floods.
- Organized and led weekly groups to volunteer at Vital Connection, a community meals project in Brisbane.

PERSONAL PROJECTS

Solving the Vehicle Routing Problem with Time Windows via Genetic Algorithms 2016

- Addresses the combinatorial optimization problem of routing a fleet of vehicles to a set of locations, where there are constraints on the times those locations must be visited. Genetic Algorithms are heuristic methods that simulate the process of biological evolution, successively mutating and killing off solutions.
- *Applications:* Delivery scheduling, remote healthcare scheduling.
- *Technology:* Custom genetic algorithm implementation using Python and Numpy.

Gesture Recognition with Leap Motion and Artificial Neural Networks 2015

- The Leap Motion is a commercially available infra-red sensing device capable of detecting hand and finger motions. While gestures can be recognized by hard-coded rules, this project allows a gesture to be defined by examples, which are used to train a feed-forward neural network classifier.
- *Applications:* ASL (sign language) interpretation, custom gesture device control.
- *Technology:* The project was written in Python using the LeapMotion SDK and PyBrain.

SKILLS

General: Reinforcement Learning, Optimization, Machine Learning, Humanoid Robotics, Automation, Operations Research

Programming: Proficient in Python, MATLAB, C/C++, Java. Basic Assembly, Javascript and PHP knowledge

Languages: English (native), German (basic)