Joseph Bowkett

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EDUCATION

California Institute of Technology   -   Burdick Group   Pasadena CA, USA
Doctor of Philosophy in Mechanical Engineering   July 2016 – February 2020
Master of Science in Mechanical Engineering   September 2014 – June 2016
Sir William Pickering Fellowship   GPA: 3.5/4.0

University of Auckland   Auckland, New Zealand
Bachelor of Engineering (Honours) in Mechatronics   March 2010 – November 2013
GPA: NZ Scale 8/9 (A), 4.0/4.0 equivalent

Sacred Heart College   Auckland, New Zealand
High School Diploma Equivalent (New Zealand NCEA standard)   February 2002 – November 2009

WORK HISTORY

NASA Jet Propulsion Laboratory   Pasadena, CA, USA
Robotics Technologist, Group Lead   March 2020 – Present
- Deputy task manager and software lead on the "Sampling Autonomy for an Europa Lander" task that developed autonomous robotic arm sampling behaviors using vision and proprioception for a prospective mission to the icy moon Europa, culminating in a field demonstration on Matanuska Glacier, Alaska.
- Developed the motor controller infrastructure that underpins the motion control capabilities of the Extant Exobiology Life Surveyor research (EELS) project, as has been featured across several media outlets.
- Cognizant Engineer responsible for delivering the robotic arm force control behaviors that are planned to insert rock sample tubes from the Mars Sample Return campaign into the Mars Ascent Vehicle to be brought back to Earth.

Research Affiliate   April 2016 – February 2020
- Developed simulations and experimental apparatus for testing several control strategies designed to mitigate residual end effector vibration in articulated arms with multiple sources of compliance, including MPC and input/command shaping
- Scripted a new module for the JPL Surrogate system from scratch to coordinate limb motions as well as capture and stitch head cam images in order to form a panoramic representation of the robot's surroundings
- Developed testing procedures and scripts to aid in the diagnosis of EtherCAT comms issues in the limb control of the RoboSimian platform
- Currently primary roboticist on Unified Processing for Icy Body Exploration (UPRITE) research project developing autonomy for mobility & manipulation, plus acting as primary maintainer of JPL Surrogate robotic platform
- Applying extension of RL multi-armed bandit theory to manipulation mode selection within UPRITE project
- Currently developing road debris removal behavior on RCTA Roman platform for the Army Research Labs, alongside researching application of deep learning to assessment of complex manipulation task post-conditions

PowerbyProxi Ltd   Auckland, New Zealand
Product Development Engineer   November 2013 – July 2014
Engineering Intern   November 2011 – March 2013
- Development and validation of embedded C software on Microchip PIC32MX platform
- Design of mechanical and electrical hardware including PCBs and mounting enclosures
- Interacted with corporate customers such as John Deere to scope new products and create development timelines
- Investigated issue of interaction between field of inductive power transfer circuitry and RF transceivers within packages sealed for industrial environments
- Led a team of engineering interns to develop a novel method of pairing RF transceivers using frequency modulation of power circuitry used for inductive power transfer
- Developed Windows Forms based software for configuring Inductive Power Transfer devices in the field, as well as electrical hardware for testing of RS232, CAN, Ethernet protocols

University of Auckland, Yacht Research Unit   Auckland, New Zealand
Undergraduate Research Assistant   April 2013 – October 2013
- Constructed racing bicycle aerodynamic drag testing apparatus in twisted flow wind tunnel for commercial client
- Used computer vision to measure frontal area of device under test and an array of force sensors