

Ruotong Jia (Rico)

Master of Science in Robotics

TECHNICAL SKILLS

Programming

- C, C++
- ROS
- Python
- MATLAB, Simulink
- Excel VBA
- R

Electrical Engineering skills

- Control Systems
- Signal Processing
- Telecommunications Systems
- Error Control Coding
- Analog Circuit Design
- Power Electronics

Tools

- Altium
- ARM Controller
- PSIM, Circuit Maker
- Oscilloscope, Multimeter
- SolidWorks
- Microchip MPLAB, PIC controller

EDUCATION

University of British Columbia
Bachelor of Applied Science – Electrical Engineering

Graduation Date:
May 2019

Northwestern University
Master of Science in Robotics

Anticipated Graduation Date:
December 2020

SCHOLARSHIPS & PRIZES

UBC BMIAI Hackathon 3 rd Place	November 2018
UBC Go Global Structured Undergraduate Research Program Award	June 2018
Scotiabank Student Mobility Award	June 2018
Dean's Honor List	May 2014
Outstanding International Student Award	August 2013

PROFESSIONAL WORK EXPERIENCE

National Laboratory of Robotics, ITESM, Mexico
Research Intern

May 2018 – August 2018

- Successfully designed and implemented PCB and mounted electronics of a micro UAV
- Implemented the communication chain between the ground station, PIC micro-controller, and Sensor Network using Telnet, Serial Communication, I2C protocols
- Developed noise reduction algorithm for barometric altitude sensor using impedance matching and a second order low-pass filter, which resulted in a 2.7dB decrease in SNR ratio and a 0.7s step response time constant
- Assisted with dynamics simulation on SIMULINK for Sliding-Mode controller design using Newton-Euler's Approach

EWOS Canada, Cargill Aqua Nutrition
Engineering Co-op Student

September 2017 – April 2018

- Actively leading, managing, coordinating multiple industrial energy conservation projects, including air leak repair, compressed air system upgrade, and pneumatic valve replacement
- Surveyed plant motors for updated power rating, power factor and frame size and updated one-line MCC diagrams
- Independently proposed and accomplished a fully-functional data entry software for QA lab using Excel VBA
- Maintain professional communications globally with other Cargill departments, consulting firms, and contractors
- Provide technical support to QA lab such as testing and sample management

DESIGN TEAM & COMPETITION EXPERIENCE

UBC Biomedical Imaging and Artificial Intelligence (BMIAI) Hackathon**November 2018****3rd Place**

- Implemented Natural Language Processing (NLP) on Tweets for sentiment analysis using Google TensorFlow in Python 3.7, achieving 76.4% accuracy with 1000 features

UBC Open Robotics**September 2018 – Present****Software Lead**

- Independently learned and trained software teammates to get familiar with C++ and ROS (Robotics Operating System) for International RoboCup 2020

UBC Sustaingineering**July 2016 – May 2018****Captain** <http://www.sustaingineering.com/the-team>

- Simulated and on using Hill-Climbing-based Perturb & Observation (P&O) MPPT algorithm for standalone solar system on Simulink
- Physically implemented a MPPT controller in a Reverse-Buck DC-DC Converter for a 6V - 12V pico solar standalone solar system
- Initiated and supervised Standalone Photovoltaic Project and Wireless Solar Pump Data Transmission System Project
- Coordinated administrative initiatives such as recruitment and weekly follow-ups
- Continuously brought motivation to the team by giving motivational speeches and care
- Implemented an Arduino-3G communication channel for wireless data transmission

TECHNICAL PROJECTS**Pan-Tilt Camera Tracking System****September 2018 - April 2019**

- Implemented a pan-tilt camera system that tracks blue objects with maximum speed at 0.7 rad/s

Rover for Outdoor Log Inspection**September 2018 - April 2019**

- Implemented Phidget1040 GPS Driver Module on ROS Melodic in C++
- Implemented a 3D Kalman Filter (including latitude, longitude, and angle from true north) for localization realized by GPS + IMU sensor fusion on ROS Melodic in C++
- Calibrated the 3D Kalman Filter with IMU variance measurements and GPS Circular-Error-Probability
- Designed PD Motor Control on driving wheels for rough terrains

Simulated Lead-Lag Based Artificial Pancreas**April 2017**

- Proposed a lead-lag controller with a feedback loop that stabilizes blood glucose within 70mU/min – 180 mU/min
- Achieved 55.2° system phase margin and 12.2 dB system gain margin
- Investigated various topologies such as feed-forward controller and Smith Predictor

Tone Mapping Operation on HDR images**December 2016**

- Designed a Gaussian filter on MATLAB
- Implemented histogram equalization algorithm on HDR images
- Built a real-time linear ceiling algorithm on MATLAB for mapping HDR luminance to SDR luminance
- Built a real-time perception ceiling algorithm for mapping HDR

Electrical Turbo-Fan Helicopter**January 2016 – April 2016**

- Established a PID-based dual-motor control system with 5% overshoot and a settling time of 2.2 seconds.
- Assembled and tested infrared distance detection unit and optical angle reading unit
- Created 255-speed simultaneous control of two DC brushless motors with one ARM microcontroller
- Designed mechanical structure of the helicopter on SolidWorks

PROFESSIONAL AFFILIATIONS**IEEE Robotics and Automation Society Student Member****February 2019 – Present****IEEE Electronic Devices Society Student Member****February 2019 – Present**