Ruotong Jia (Rico)

773 273 1566 | ruotongjia2020@u.northwestern.edu | https://ricojia.github.io/

EDUCATION

Masters of Science in Robotics, GPA 3.62/4.0   **December 2020**
- *Northwestern University, Evanston, IL*

Bachelor of Applied Science in Electrical Engineering   **May 2019**
- *University of British Columbia, Vancouver, BC, Canada*

SKILLS

- **Programming: C, C++, Python, MATLAB, Excel VBA, Git, XML, Concurrency**
- **Robotics: ROS, Rethink Intera, Microchip PIC, Arduino, Motion Planning, Filter-Based SLAM**
- **Electrical Engineering: Control Systems, Signal Processing, Power Electronics**
- **Coursework: Machine Learning, Deep Learning, Advanced Computer Vision, Robot Navigation, Kinematics, Dynamics, Operating System, Mechatronics**

WORK EXPERIENCE

Research Intern | *National Laboratory of Robotics, Tecnológico de Moerrey, Mexico*   **May - July 2018**
- Successfully manufactured PCB and mounted electronics of a micro UAV, as long as the communication chain between the ground station, PIC microcontroller, and Sensor Network using Telnet, Serial Communication, I2C protocols
- Developed noise reduction algorithm for barometric altitude sensor using impedance matching and a first 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

Engineering Co-op Student | *EWOS CANADA, CARGILL INC., Surrey, Canada*   **September 2017 - May 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
- Provided technical support to QA lab such as testing and sample management

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TECHNICAL PROJECTS

Motion Planning Packages (https://github.com/RicoJia/Motion_Planning_Rico**)**   **March 2020 - Present**
- Developing maps (PRM, Grid Maps), global planning algorithms (A*, Theta*), global incremental planning algorithms (LPA*, D* Lite), DWA, and control (MPC) packages for Turtlebot 3 Burger in a virtual room

Landmark-Based SLAM Simulator   **March 2020**
- Developed a landmark-based SLAM simulator in C++ and Python that composed of: a kinetics model of Turtlebot 3 Burger based on screw theory, a robot navigation node using waypoints, simulated landmark observations, and a simulated 2D laser scanner detector
- Verified the correctness of the simulator using a known-correspondence Extended Kalman Filter (EKF)
- Built feature association for cylindrical landmark recognition with 97% accuracy using circular regression

Robot Artist   **December 2019**
- Developed an effective a Depth-First-Search based path planning algorithm for drawing on letter-size paper
- Built a robust linear trajectory planning algorithm for Rethink Sawyer robot with Intera's Inverse Kinematics tools (ROS Python), and a P force controller on the robot gripper

Rover for Outdoor Log Inspection   **September 2018**
- Implemented Phiget1040 GPS Driver Module on ROS Melodic in C++ and developed a linear Kalman Filter for localization realized by GPS + IMU sensor fusion on ROS Melodic in C++
- Designed PD Motor Control on driving wheels for rough terrains using state-space control techniques

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DESIGN TEAM & COMPETITION EXPERIENCE

UBC Biomedical Imaging and Artificial Intelligence (BMIAI) Hackathon - *3rd Place*   **November 2018**
- 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 Sustaingineering - *Captain*   **July 2016 - May 2018**
- Designed a Perturb & Observe (P&O) MPPT algorithm for a 6V-12V pico standalone solar system on Simulink, later implemented the controller in a Reverse-Buck DC-DC Converter topology
- Initiated and supervised Standalone Photovoltaic Project and Wireless Solar Pump Data Transmission System Project
- Implemented an Arduino-3G communication channel for a solar pump's wireless data transmission with its control computer