

# Raymond (Mingguang) Yang

Philadelphia, PA | Willing to relocate

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## EDUCATION BACKGROUND

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**University of Pennsylvania, Philadelphia, PA**

*Aug 2024 – May 2026 (Expected)*

M.S.E. in Mechanical Engineering (Mechatronics and Robotics stream),

GPA 3.95/4.00

**University of Toronto, Toronto, Canada**

*Sep 2019 – June 2024*

B.A.Sc. with Honors in Mechanical Engineering (Mechatronics and Manufacturing stream),

GPA 3.77/4.00

## SKILLS & QUALIFICATIONS

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**Design & CAD:** SolidWorks (advanced), Creo Parametric, CATIA, 3D printing, mechanism design, machining & prototyping

**Embedded & Low-Level:** C/C++, sensor fusion, CAN/SPI/I2C communication, Multi-threading

**ROS2 & Software Stack:** ROS2 nodes/services/actions, Python, TF2, ROS2 control, Rviz2/Gazebo, hardware bring-up

**Controls & Algorithms:** PID, LQR, MPC basics, trajectory tracking, state estimation, EKF-like filtering principles, kinematics/dynamics modeling, path planning

**Prototyping & System Integration:** Hands-on robot assembly, wiring, PCB bring-up, electromechanical system debugging

**Perception & Sensor:** IMU calibration, encoder processing, stereo/camera integration, OpenCV, pose estimation

## ROBOTICS EXPERIENCES

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**Multi-Platform Lunar Rover System (NASA LuSTR), UPenn, Philadelphia, PA**

*Jan 2025 – Feb 2026 (Expected)*

- Designed and modeled an aluminum chassis and turret assembly in SolidWorks, supporting a 60 kg combined load while reducing mass by ~15 % through DFM optimization.
- Developed the rover's embedded control stack (C++ on RPI), implementing PWM motor drivers, encoder feedback, IMU fusion, and closed-loop velocity control, achieving <2% tracking error.
- Designed a small interface PCB for the rover's sensing and actuation stack, integrating power routing, connector management, and basic filtering to replace a fragile hand-wired setup.
- Integrated 48V & 12V power distribution with protection circuits and DC-DC modules; validated current draw, thermal behavior, and system stability under outdoor load variations.

**Arena Battle Robot, UPenn, Philadelphia, PA**

*Aug 2024 – Dec 2024*

- Built the powertrain system integrating high-torque brushed DC motors, gearboxes, and belt/pulley transmission; validated torque requirements, stall current, and thermal performance during repeated impact loads.
- Developed lightweight C++ control firmware on ESP32 for weapon activation, drive mixing, motor PWM generation, and failsafe logic. Tuned response curves for fast but stable maneuvering.

**Autonomous Maze-Solving Robot, UofT, Toronto, Canada**

*Aug 2024 - Dec 2024*

- Developed a real-time sensing and planning system on Arduino using Python, integrating 5 ultrasonic sensors, dual encoders, and IR trackers for dynamic obstacle avoidance and localization at 10 Hz update rate.
- Implemented A\* path-planning algorithm, enabling full maze traversal and block transport with  $\pm 2$  cm waypoint accuracy.

**Bench Power Supply PCB, UofT, Toronto, Canada**

*Jan 2023 - May 2023*

- Selected components using first-principles reasoning (efficiency, thermal rating, current capability, switching frequency) and created schematics + 2-layer layout (KiCad).
- Designed and laid out a bench power supply PCB (5–20 V output) including DC-DC buck/boost converters, current limiting, soft-start, reverse protection, and thermal considerations.

## INDUSTRY EXPERIENCES

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**Process Engineer, Bittelle Electronics Inc., Toronto, Canada**

*May 2022 – Sep 2023*

- Reviewed 300+ PCB and mechanical assemblies for DFM and IPC-A-610 compliance, identifying manufacturability issues early in production.

**Mechanical Engineer, Jiangnan Mould & Plastic Technology Co., Ltd, Shanghai, China**

*Apr 2021 – Aug 2021*

- Designed and validated 3+ automotive bumper prototypes in CATIA, performing tolerance analysis and GD&T review for Tier 1 OEM projects.
- Tested 10+ iterations of full-scale prototypes to meet design specifications and standards.