

Matthew Abbate

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Education

Rensselaer Polytechnic Institute – Master of Engineering (M. Eng.) in Mechanical Engineering – Control Systems 2022
Rensselaer Polytechnic Institute – B.S. in Mechanical Engineering 2021

Skills

Programming: Python, C/C++, MATLAB, SQL, SPEL+ (Visual Basic), HTML

Mechanical Design: CAD, 3D Printing, Additive Manufacturing, Design for Manufacturing

Software: MATLAB, Simulink, Siemens NX, SolidWorks, 3DEXperience

Control Systems: State-Space Modeling, PID, Linear Quadratic Regulator (LQR), Kalman filters

Experience

Controls Engineer, eMagin, a Samsung Display Company – Hopewell Junction, NY Sept 2024 – Present

- Created consumable tracking system to monitor 24VDC pulse signals to estimate material usage within 2% using a Raspberry Pi. Real-time data logged via Python PyQt5 GUI with auto-save, data purge, and estimation features
- Led qualification of precision gantry system with wafer handling robots for adhesive and glass lens placement
- Refined adhesive mixing process and reduced translucent adhesive particle counts by 40%
- Designed and 3D printed custom suction cups out of Silicone 40A material, doubling life compared to NBR material
- Developed glass lens inspection parameters by parsing logged output data, significantly reducing escaped defects
- Built dashboards and rework loops to enable real-time wafer tracking on web-based MES software
- Collaborated with cross-disciplinary team to author and execute qualification plans for new tools including organic deposition, glass inspection, and glass placement tools

Electrical Engineer, Manufacturing, Sikorsky, a Lockheed Martin Company – Stratford, CT Jan 2023 – May 2024

- Responsible for the assembly and installation of electrical connectors, harnesses, boxes and panels on aircraft
- Integrated force sensor into robot to eliminate pin insertion failures caused by lateral forces
- Incorporated second camera into vision system to enable background processing and to reduce cycle time by 10%
- Designed connector staging area within robotic cell, simplifying the calibration process
- Reviewed and implemented engineering changes to ensure feasibility from an electrical standpoint

Graduate Research Assistant – Rensselaer Polytechnic Institute – Troy, NY Jan 2022 – Dec 2022

- Designed and assembled electrical harnesses to connect high-speed air spindle into robot controller
- Integrated coolant pump into welding robot to investigate the effect of cooling rates on material properties

Manufacturing Engineer Intern, Sikorsky, a Lockheed Martin Company – Stratford, CT May 2022 – Aug 2022

- Redesigned robotic cell pin staging tool, eliminating part pick-up failures

Test Engineer Co-Op, Aerosonic, LLC – Clearwater, FL Jan 2021 – Aug 2021

- Optimized calibration procedure for air data systems by altering Python script, reducing procedure time by 10%
- Designed numerous fixtures and electrical test boxes for testing of pitot and static probes

Projects

Embedded ESP32 Balancing 2-Wheeled Robot (matthewabbate.dev)

- Implemented a cascaded control loop architecture, with a PI velocity loop and PD angle loop, to achieve stable two-wheeled balance, integrating real-time motor actuation and sensor feedback
- Integrated wireless Bluetooth control of robot using PS4 remote via Bluepad32 toolbox, implementing joystick smoothing, circular normalization, and adaptive steering algorithms for high-speed operation

Quadcopter Drone Build (matthewabbate.dev)

- Assembled and flew 5" quadcopter drone, including the configuration of flight controller, transmitter & receiver
- Implemented PID control with feedforward input to achieve improved performance. Tuned by collecting and analyzing flight data to increase responsivity and reduce overshoot & error