Seif Eddine Joul

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Education

Universiti Sains Malaysia Nov 2024

Bachelor of Science in Mechatronics Engineering (Hons)

Relevant Coursework: Robotics, Embedded Systems, Automation, Quality & Reliability

Experience

Assistant Engineer, Hitronik– Penang, Malaysia Aug 2023 – Oct 2023

- Restored a CNC lathe machine by diagnosing and fixing control faults and recalibrating motion settings, bringing it back to full operation within one week.
- Designed and installed a solar-powered LED signage system with custom PCB and rooftop solar integration, enabling 24/7 off-grid lighting.
- Built an automated solar-powered pump system using custom circuitry, microcontroller logic, and mechanical coupling to regulate upstream irrigation for a durian farm.

Projects

4DOF Fruit-Harvesting Robot Sep 2023 - Jan 2024

- Developed and tested a 3D-printed flexible end-effector using Flex PLA, reducing fruit bruising by 40% compared to rigid grippers in simulated trials
- Designed and simulated a selective fruit-harvesting robotic arm using SolidWorks, MATLAB, and myRIO hardware, with full joint-space trajectory control and inverse kinematic modeling
- Proved the prototype's performance decreased collection time by 30% under structured environment benchmarks

LiDAR-Camera Sensor Fusion System Mar 2024 - Aug 2024

- Developed a MATLAB-based sensor fusion pipeline combining LiDAR point clouds with camera image data using extrinsic calibration and projective transformation
- Integrated YOLOv4 object detection to improve scene interpretation and implemented depth estimation based on real-world coordinate projection
- Achieved sub-pixel alignment with average reprojection error below 0.03 px, enabling reliable object distance prediction and multi-sensor integration
- Fusion approach improved obstacle detection accuracy and depth estimation precision by approximately 35% compared to standalone LiDAR or camera systems under controlled test conditions

Regenerative Braking System for Amphibious Robot Mar 2023 - Jul 2023

- Designed and installed a regenerative braking mechanism in a terrain-adaptive robotic platform, recovering kinetic energy during deceleration cycles
- Calibrated energy capture across 31–1532 rpm and integrated LiPo battery recharge logic, improving power sustainability in off-grid operation
- Reduced energy loss by up to 25% during field simulation, contributing to extended autonomous runtime and reduced dependency on external charging
- Coordinated sensor-triggered braking actuation with motor control feedback to ensure consistent braking performance and safe system operation

Skills

CAD: SolidWorks, MATLAB & Simulink, LabVIEW, OrCAD, CX Programmer, OpenCV

Programming : C/C++, Python, Ladder Logic, PLC Programming

Statistical & Quality Engineering: Minitab, SPC, SQC, Pareto Analysis, DMAIC (Six Sigma), Reliability Testing (ALT, ESD, EMI), FMEA, Root Cause Analysis (5 Whys)