

JASE PETTY

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TECHNICAL SKILLS

Languages: C/C++ (C++11/14/17), Python, MicroPython, SQL, YAML, Bash, MATLAB
Robotics & Controls: ROS2, SLAM, A* Path Planning, Temporal Heatmaps, Computer Vision (OpenCV), PID, State-Space
Embedded & Hardware: STM32 (ARM Cortex-M), FreeRTOS, Jetson AGX Orin, Raspberry Pi, UART/SPI/I2C, Timers, Encoders
Tools & Frameworks: TensorRT (FP16 Optimization), PyTorch, CUDA, PyQt/PySide6, SQLite, SolidWorks, Git, Docker

ENGINEERING EXPERIENCE & TECHNICAL PROJECTS

Undergraduate Researcher (MARCO Platform)

Jan 2026 – Present

Mechatronics & Controls Research Lab, Texas A&M University – College Station, TX

- Optimized multi-camera Birds-Eye-View (BEV) elevation mapping pipeline from 2 Hz to 30 Hz on Jetson AGX Orin, streaming 50 mm real-time terrain costmaps to MPC for dynamic trajectory planning.
- Deployed disk-cached TensorRT FP16 execution engines on GPU; fine-tuned perception models on targeted field edge cases to eliminate false-positive elevation artifacts for MPC trajectory planning.
- Rebalanced xHCI USB controller bus topology across 4 ZED2i stereo cameras, eliminating dropped frames and stabilizing visual odometry pipelines for autonomous field trials.

Lead Software & Control Engineer (FlexSense Capstone)

Jan 2026 – Present

Squish Therapy, Texas A&M University – College Station, TX

- Co-designing upper-limb rehab test bench to stream biomechanical telemetry for physical therapist, paired with a 60 FPS PySide6 clinical GUI.
- Architecting STM32F4 firmware utilizing a multi-rate cooperative task scheduler (1 kHz sensing, 100 Hz control) and 28-byte packed binary telemetry over USB VCP.
- Formulating feedforward + anti-windup PID model to regulate a disc brake with a NEMA17 Stepper (targeting $\pm 1.5\%$ torque tracking)

Lead Engineer (Active Thrust Vector Control Test Rig)

Jan 2026 – May 2026

ESET 462 (Control Systems), Texas A&M University – College Station, TX

- Designed active 1-DOF inverted pendulum TVC test rig with an Electric Ducted Fan (EDF) and MG90S servo gimbal; derived 2nd-order plant equations isolated from gyroscopic cross-axis precession.
- Architected event-driven FreeRTOS firmware with 200 Hz Timer2 sensing, $4\times$ decimation to 50 Hz control cascade, and atomic critical sections, achieving stable recovery with ~ 0.35 s rise time.
- Integrated quadrature rotary encoder with dual hardware RC low-pass and software Tustin derivative filtering ($\tau_f = 0.05$ s), eliminating high-RPM EDF noise and servo chatter.

Lead Software & GNC Engineer (BevBot Autonomous Delivery Robot)

Aug 2025 – Dec 2025

MXET 300 (Mechatronics I), Texas A&M University – College Station, TX

- Built autonomous beverage delivery robot on SCUTTLE mobile chassis utilizing BreezySLAM (RMHC-SLAM, 10 mm resolution) on 180° SICK TiM561 LiDAR scans (541 points, 15 Hz).
- Developed temporal staleness grid tracking elapsed revisit times with $60^\circ/2\text{m}$ camera FOV clearing, paired with A* global planning and vortex potential fields to escape concave traps.
- Engineered threaded OpenCV visual servoing pipeline tracking customer flags ($d_{\text{est}} = 50/\text{width}$) with 5 s spatial memory and an autonomous navigation executive FSM.

Software Development Intern (Clinical Data Infrastructure)

Sep 2022 – Dec 2024

August Schools – New York, NY (Remote)

- Authored prebuilt queries and standardized schema query rules in MongoDB, enabling clinical staff across 30+ schools to retrieve student health records without writing complex queries.
- Optimized multi-field aggregation pipelines and compound B-tree indexing, decreasing report generation latency by up to 90%.
- Authored and maintained automated HIPAA-compliant YAML CI/CD deployment pipelines using Git and Docker.

EDUCATION

Texas A&M University – College Station, TX

B.S. Mechatronics Engineering Technology

Minors: Mathematics and Embedded Systems Integration

Graduation: Dec 2026

Cumulative GPA: 3.31