DENNIS SLOBODZIAN

ROBOTICS SOFTWARE | CONTROLS | PERCEPTION | EMBEDDED SYSTEMS

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PROFILE

Electrical and computer engineer focused on real-time robotics software, controls, perception, and hardware/software integration. Experience spanning C++ robot control, AprilTag/Kalman localization, LQR state-space feedback, GPU-accelerated vision, PCB design, embedded firmware, and physical-system debugging.

CORE COMPETENCIES

ROBOTICS & CONTROLS C++, Python, LQR, state-space control, motor control, sensor integration, FSMs, autonomous behavior	**LOCALIZATION & PERCEPTION** AprilTags, Kalman-filter pose estimation, YOLOX, object detection, segmentation, model evaluation
SYSTEMS & ACCELERATION CUDA, TensorRT, NVIDIA Jetson, Linux, CMake, Docker, Git/GitHub, Xilinx performance profiling	**HARDWARE & TEST** PCB design, Altium, KiCad, embedded firmware, telemetry, hardware debugging, physical robot validation

EXPERIENCE

IDEXX | Westbrook, ME
Jan 2025 - Present

Data Scientist • Computer Vision / Machine Learning

- Develop and validate production-oriented object-detection and segmentation models through controlled experiments, debugging, data-quality analysis, and deployment-focused evaluation.
- Customized a YOLOX architecture for proprietary imagery, delivering approximately 2x faster inference; built automated mask-annotation tooling for large cell images.

IDEXX | Westbrook, ME
May 2022 - Dec 2024

Computer Vision / Machine Learning Intern

- Optimized an annotation and model-development data-aggregation workflow from more than 24 hours to under 2 hours. Developed annotation and mask-generation automation for high-resolution imagery.
- Developed artificial annotations with GANs and VAEs to improve data coverage in limited datasets.
- Created synthetic images emplacing objects from positive signal data to negative signal data with poisson blending to improve detector performance.

THE OUTLIERS - FRC TEAM 5687 | Portland, ME
Jan 2022 - Present

Robotics Software & Controls Mentor

- Develop and mentor C++ control software for mobile competition robots, integrating drivetrain and mechanism control, motor controllers, sensors, autonomous behaviors, telemetry, and physical-hardware validation.
- Use AprilTag measurements and Kalman-filter-based pose estimation for localization and autonomous operation; implement and teach LQR/state-space feedback for differential-drive control.
- Supported migration of robot-control code from Java to C++ on constrained Xilinx hardware; profiled and debugged control-loop performance, with measured runtime improving from approximately 20 ms to 1-2 ms.

SELECTED TECHNICAL PROJECTS

V-JEPA 2 DRAKE ARM SIMULATION | Python, Drake, Pytorch, uv

- Built a Drake simulation experiment using a KUKA iiwa arm and V-JEPA2 embeddings to test whether pretrained video representations capture robot-motion structure. Evaluated motion-class separation with nearest-neighbor accuracy, clustering metrics, and cosine similarity, then used latent similarity to derive a dense reach-task progress signal.

VISION SYSTEM | C++, CUDA, TensorRT, Jetson, CMake, Docker

- Built a modular YOLO-based 3D vision pipeline for NVIDIA Jetson; implemented CUDA preprocessing and TensorRT-optimized inference for real-time edge deployment. Added tests, CMake builds, Docker assets, and GitHub Actions.

EMBEDDED HARDWARE & LOW-LATENCY FIRMWARE | PCB Design, C, Embedded Systems

- Designed a motor-controller PCB and a wireless 8 kHz mouse/dongle firmware project, applying schematic/PCB design, embedded timing, hardware interfaces, debugging, and hardware/software integration. Mouse firmware

EDUCATION & PUBLICATION

UNIVERSITY OF SOUTHERN MAINE
Dec 2024

B.S., Electrical & Computer Engineering • Honors: Academic Excellence in Computer Science; Robotics Award

Publication:

Slobodzian, D., Kordijazi, A. “Deep Learning Framework for Early Detection of Pancreatic Cancer Using Multi-modal Medical Imaging Analysis.” Journal of Imaging Informatics in Medicine, 2026. doi:10.1007/s10278-026-01998-w