GABRIEL EMIR GOZUM

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EXPERIENCE

Applied Intuition ↗ | Perception Engineer   Aug 2023 - Current
· 3D object tracking and multi-modal sensor fusion algorithm development using production grade C++20 for on-road and off-road ODDs
· 4D RADAR point-cloud undistortion, noisy point-cloud clustering and tracking
· Implemented 6-camera surround-view algorithm with classical CV methodologies
· Engineered in-house, distributed, perception evaluation pipeline

Anduril ↗ | Perception Intern   Jun 2022 - Aug 2022
· Developed efficient real-time CV tracker in C++17 for aerial platforms
· Improved upon prior optical flow based model by 23% (measured via HOTA metrics)
· Reduced labeller workload 29x by implementing high-framerate auto-labelling pipeline

University of Wisconsin, Madison ↗ | Deep Learning Researcher   Aug 2021 - Jun 2022
· Research focus on out-of-distribution classification for object detectors under Dr. Sharon Li
· SOTA detection algorithms implemented in PyTorch and trained on large-scale GPU clusters

Tesla ↗ | Autopilot Digital Signal Processing Intern   May 2021 - Aug 2021
· Engineered the de facto confidence metric for 4D point cloud data in Autopilot 4
· Updated in-house RADAR DSP algorithms via SIMD hardware acceleration for multi-core processor with shared memory FPGA interaction

Tesla ↗ | Autopilot Sensing Intern   Jan 2020 - Aug 2020
· Developed SLAM based object recognition algorithm with $O(N)$ complexity compared to prior $O(N^2)$ for in-house ultrasonics
· Large-scale data analysis for rain and blocked sensor detection

Wisconsin Racing FSAE ↗ | Firmware Lead   Jun 2019 - Aug 2021
· Battery management system firmware, driver level interaction to Kalman filter SOC modeling
· Designed modular battery electronic system utilizing the LTC6811 IC from schematic to PCB

PUBLICATIONS

Shaping Representations for Detecting Out-of-Distribution Objects ↗   NeurIPS 2022
Xuefeng Du, Gabriel Gozum, Yifei Ming, Yixuan Li

Unknown-Aware Object Detection ↗   CVPR 2022
Xuefeng Du, Xin Wang, Gabriel Gozum, Yixuan Li [**Poster Presentation**]

EDUCATION

University of Wisconsin, Madison
College of Computer Sciences, M.S. Computer Sciences
College of Engineering, B.S. Electrical Engineering and B.S. Computer Sciences

SKILLS AND INTERESTS

Languages	C++20, Python, C, MATLAB
Packages and Software	Eigen, NumPy, OpenCV, PyTorch, ROS, Bazel, AWS, Git, Docker
Personal	Running, Climbing, Algorithmic Trading, Chess, Poker

PERSONAL RESEARCH

Law Enforcement Radio Decryption and Analysis | gozum.io ⧉   Nov 2022 - Aug 2023
· On-edge hardware level P25 Phase I/II decoding with LimeSDR Mini
· Multi-processed software to convert voice data into textual data using Whisper
· Custom transformer-based name entity recognition model with 86% accuracy
· Interactive, live-updating map of police activity in Madison, WI

Adversarial-aware Object Detection | github.com ⧉   Jan 2023 - Aug 2023
· DARPA funded research under Dr. Kassem Fawaz
· Fine-tuned diffusion model with distributed GPU training clusters
· Top 5% score in Armory evaluation framework

ACHIEVEMENTS

Licensed Amateur Radio Operator | Federal Communications Commission   Dec 2021
Technician class license: *KF0DAN*

Avalanche 1 Certification | AIARE   Dec 2021
Maintain proper communication and coordination in critical backcountry terrain

Private Pilot | Federal Aviation Administration   Ongoing