# Alexiy Buynitsky

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## Goal

I'm a 4+1 student at Purdue doing a Master's in CS, while completing my Bachelor's as a double major in CS and Math at Purdue. I love learning anything new and I want to apply my experiences and knowledge to cutting-edge projects that leverage the forefront of CS. I'm confident my drive, passion, work ethic, and curiosity will help me make valuable contributions.

## Education

**Purdue University** | *West Lafayette, IN* Aug 2024 – May 2025
*M.S. in Computer Science* **GPA: 4.00**
**Courses:** Robotic Learning, Machine Learning

**Purdue University** | *West Lafayette, IN* Aug 2022 – May 2025
*B.S. in Computer Science, B.S. in Mathematics* **GPA: 4.00**
**Courses:** Algorithms, Linear Algebra I & II, Abstract Algebra, Systems Programming, Data Structures & Algorithms Real Analysis, Discrete Math, Computer Architecture, C Programming, Physics E&M, Statistics Complex Analysis, Artificial Intelligence, Probability

**De Anza College** | *Cupertino, CA* Jun 2021 – Jun 2022
*Double Enrolling HS Student* **GPA: 4.00**
**Courses:** Differential Equations, Multivariable Calculus, C++ Programming, x86 Programming, Python Programming

## Experience

**AI Engineer Intern @ Armada AI** | *Remote* Oct 2023 - Present
- First Intern at Armada AI building Edge AI Applications for remote compute hardware
- Developing spatially aware CV and LLM robotic control methods by generating synthetic data and finetuning models using SFT and DPO
- Building VideoQA assistant for realtime video Q&A for security camera footage
- Build prompting library with support for customizable prompting formats, single / multi-shot prompting from variable datasets, open/closed source LLMs / custom checkpoints

**Undergraduate Robotics Researcher @ CoRAL Lab** | *Purdue* Aug 2023 - Present
- Conducting research on robotic learning under the supervision of Professor Ahmed Qureshi
- Extended Unitree simulator to support Unitree B1 Quadruped Robot in Gazebo and PyBullet
- Researching Motion Planning in dynamic environments via Active NT Fields and Sign Distance Fields
- Teaching robots to navigate through Purdue with custom knowledge using LLMs, RAG, and vector databases

**Engineering Intern @ SpaceX** | *Redmond, WA* May 2023 - Aug 2023
- Develop mechatronic / software solutions for quicker manufacturing and assembly of Starlink Satellites
- Prototype satellite assembly cells, working with 6-axis robotics arms, CV, actuators, sensors, & safety hardware
- Achieve 80x speedup between PLC & CV software by developing a TCP-like communication library

**Tensorflow Model Developer @ Google x Duality Lab** | *Purdue* Jan 2023 - May 2023
- Building data pipeline for Maskformer and Mask2former using Google Deeplab2 and Tensorflow
- Generate, decode, and load TFRecords for panoptic segmentation from COCO dataset with Bash and Python
- Apply random-cropping and color jitter to images/masks, create project config and data loaders

**TE AI Cup @ Te Connectivity x ML @ Purdue** | *Purdue* Nov 2023 - May 2023
- Achieved 83% accuracy in forecasting sales for 1300+ products using LSTMs, and Time Series Transformers
- Build framework to study the effects of external economic indicators on model prediction for any time-series data

**IRL Rocket League @ Autonomous Robotics Club** | *Purdue* Apr 2022 - Dec 2022
- Refactor sim to better reflect real-world conditions by randomizing physics dynamics, tuning car properties, and simulating latency with Rospy and ROS

**Signal Procesing Intern @ The SunScool App** | *Sunnyvale, CA* Apr 2022 - Oct 2022
- Trim, normalize, and denoise voiceovers from 80+ chapters with noise profiles, High and Low Pass filters
- Adjusted audio volume and determined parameters for audio voice overs with FFmpeg and SOX

## Projects

**Gesture Controlled HCI** | *Pytorch, Flask, MongoDB* Jan 2024 – Mar 2024

- Built a continuous learning model to detect hand poses at 30FPS allowing for customizable gestures
- Categorized hand gestures through VLMs and vector databases and create custom actions using open-interpreter

**Robotics Mini-Projects** | *Pytorch, Gazebo, Pybullet, ROS* Jan 2024 – May 2024

- Implement (bi)RRT, (bi)RRTConnect, RRT* for cars and 6-DOF arms; Iterative/Analytic PID for Quadruped robots and 2-DOF arms; MPNet in 2D/3D environments; VPG for 2-DOF arm

**1st Place Purdue BoilerMake X Hackathon Dagshub** | *Pytorch, MLFlow, DVC, Dagshub* Jan 2023

- Used seq2seq model to study key factors affecting air quality. Created a robust, modular testing environment for time-series forecasting with any data through MLFlow, DVC, and git using DagsHub

**Image Processing** | *Pytorch* Oct 2022

- 1st place in ML@Purdue Pokémon Classifier Competition using VGG16s, and transfer learning with ResNets
- Tracked objects with K-means clustering, and created image masks and filters

## Technical Skills

**Languages**: Python, C/C++, Java, TypeScript, C#, Bash, x86 Assembly, SQL
**Frameworks**: Pytorch, Tensorflow, RPC, ROS
**Platforms/Tools**: VIM, Conda, Catkin, Linux, Github, Dagshub, Docker, Direnv, Pixi, Onshape