# Troy Dutton

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## EDUCATION

**THE UNIVERSITY OF TEXAS AT AUSTIN** — Austin, TX
Bachelor of Science — May 2025
Electrical and Computer Engineering Honors
Cumulative GPA: **3.98**
Relevant Coursework: OS; Algorithms; SWE Lab; Software Design & Implementation I/II; Probability; Matrices & Matrix Calc.

## EXPERIENCE

**TEXAS SPACECRAFT LABORATORY** — Austin, TX
Vision Development Engineer — October 2023 – Present
- Refining a keypoint prediction model for subsequent integration into an autonomous pose estimation algorithm.
- Aided in the design of a ETL-based pipeline to enrich training data by incorporating synthetic imagery.

**THE UNIVERSITY OF TEXAS AT AUSTIN** — Austin, TX
Computational Reconstruction Researcher — Aug 2023 – Present
- Developing a platform to evaluate the performance of low-cost imaging systems for use in computational microscopy.
- Exploring the integration of computer vision into algorithmic image reconstruction to enhance resolution and reduce noise.

**APPLIED RESEARCH LABORATORIES** — Austin, TX
Machine Learning Intern — May 2023 – Aug 2023
- Devised a model to generate pixel-wise annotations in sonar images of the seafloor for use in underwater mapping.
- Implemented an unsupervised, positive-pair training paradigm in PyTorch to eliminate the reliance on hand-labeled data.
- Benchmarked the proposed algorithm against pre-trained models and traditional texture-based segmentation techniques.

**THE UNIVERSITY OF TEXAS AT AUSTIN** — Austin, TX
Photonics Researcher — Aug 2022 – May 2023
- Created a system to characterize infrared detectors using a two-axis double lens setup in the Mid-IR Photonics Lab.
- Interfaced with motors and amplifiers in Python to perform a precise scan of a detector across a standardized sample.

**THE UNIVERSITY OF HOUSTON** — Houston, TX
Nanofabrication Researcher — May 2022 – Aug 2022
- Prototyped a device controlled by a custom LabVIEW GUI to evaluate the performance of a lateral flow assay biosensor.
- Automated testing using a linear actuator and 3D-printed parts to standardize and accelerate the data collection process.

## PROJECTS

**ASL IDENTIFIER** — Oct 2022
- Designed a real-time American Sign Language (ASL) classifier, which accurately matches gestures to their respective letters.
- Enhanced model accuracy by extracting hand landmarks from standard ASL datasets using a pre-trained MediaPipe model.

**CHESS ENGINE** — May 2023
- Developed a chess engine featuring a Monte Carlo Tree Search (MCTS) algorithm, inspired by DeepMind's AlphaZero paper.
- Trained a neural network to act as a policy predictor using self-play based reinforcement learning and an initial set of GM games.

**CONWAY'S GAME OF LIFE** — Feb 2022
- Trained an agent using Deep Q learning to compete in a competitive, two-player version of Conway's Game of Life.
- Formalized the rules of the game in a TensorFlow environment to enable the agent to be trained using reinforcement learning.

**WORDLE SOLVER** — May 2022
- Generated optimal wordle guesses by fine-tuning the transition between maximal expected information and answer likelihood.
- Devised an algorithm rooted in information theory, which generates intelligent predictions by analyzing the user guess history.

## SKILLS & INTERESTS

**Technical Skills**: Python, C, C++, Java, Matlab, HTML, React, Pytorch, Tensorflow, MongoDB, Linux, Git, LabVIEW
**Organizations:** Tau Beta Pi, Texas Spacecraft Laboratory, Machine Learning and Data Science Club, IEEE UT