



EDUCATION

M.S. Computer Science

University of Illinois at Urbana-Champaign, Thesis Topic: Computer Vision & Deep Learning

May 2022
GPA: 4.00/4.00

B.S. Computer Science, Minor in Statistics

University of Illinois at Urbana-Champaign

May 2021
GPA: 3.96/4.00

Coursework Computational Photography, Computer Vision, Machine & Deep Learning

TECHNICAL SKILLS

Languages Python, C++, C, Java, Javascript, Typescript, SQL, Bash

Frameworks PyTorch, OpenCV, TensorFlow, Linux, Git

PROFESSIONAL EXPERIENCE

NVIDIA | Inference Software Engineer, TensorRT

Santa Clara, CA | Aug 2022 – Present

- Prototyped LLM weight and KV-cache offloading to enable **large-language-model** inference on a single GPU
- Reduced system memory usage by over 50% for **generative transformer models** (GPT3, BART)
- Extended the TensorRT Fill layer to include a wrap mode

NVIDIA | Software Engineering Intern, TensorRT

Santa Clara, CA | May 2021 – Aug 2021

- Introduced a software-based kernel timing heuristic (DLSim) for **neural network optimization**
- Bridged **C++** TensorRT and **Python** DLSim by implementing a server-client interface handling 10s of queries/s with convolutional layer parameter translation
- Compared 5 networks (**ResNet-50**, **MobileNet**, **Inception-V4**, etc), across 3 batch sizes and FP16, INT8 precision, meeting the <10% throughput reduction goal

Amazon | Software Development Engineer Intern

Seattle, WA | May 2020 – Aug 2020

- Reduced aggregate **Javascript** asset build time by 18.5% and decreased memory usage by 11%
- Analyzed code syntax trees for unfavorable behavior, decreasing final asset size by 5%
- Designed a variant generation algorithm an **order of magnitude faster** for server built variants and client responsive variants

Distributed Autonomous Systems Laboratory

Jan 2020 – May 2020

Undergraduate Research Assistant | Advisors: Dr. Girish Chowdhary, Dr. Saurabh Gupta

Urbana, IL

- Investigated vision-based robot heading estimation with a **self-supervised network** on **PyTorch** achieving 2 degrees error
- Devised a **supervised network** for autonomously calculate pose and drive a robot with distance to intervention of 30 meters
- Augmented video data with **homographic transformations** to simulate robot variance and increase dataset coverage

EarthSense | Computer Vision Research Intern | Advisor: Dr. Girish Chowdhary

Champaign, IL | Sep 2019 – Dec 2019

- Ascertained intrinsic camera matrices of Terrasentia robot cameras
- Achieved 92% accuracy for corn ear height estimation from video by fusing a **neural network** with **single view metrology**

Northrop Grumman | Software Engineering Intern

Rolling Meadows, IL | May 2019 – Aug 2019

- Developed a C# application to configure and test missile warning algorithms and pulled in project schedule by 2 months

EarthSense | Computer Vision Intern

Champaign, IL | Sep 2018 – May 2019

- Trained a **convolutional neural network** with **TensorFlow** on a biased dataset to classify lodging of wheat with 80% accuracy
- Deployed a **TensorFlow ML** model to detect and count plant stems with 96% accuracy

PROJECT HIGHLIGHTS

HackIllinois Stock Analysis

- A python package discovering sentiment about a company from its tweets using NLTK and correlating it with stock price
- **Linear**, **ridge regression**, and a **convolutional neural network** are used for prediction and compared against each other

CU-Recycle

- Devised an Android application to report an item's recyclability status in the Urbana-Champaign area, **winning 2nd** at PygHacks
- Trained a convolutional neural network for **object recognition** with **Keras** to overcome lighting and object variance

PUBLICATIONS

Learned Visual Navigation for Under-Canopy Agricultural Robots | *Robotics: Science and Systems*

2021

Arun Sivakumar, **Sahil Modi**, Mateus Gasparino, Che Ellis, Andres Velasquez, Girish Chowdhary, Saurabh Gupta