Stefan de Lasa

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Education

University of Toronto, Bachelor of Applied Science & Engineering - Computer Engineering 2020-2025
Seasonal GPA: 4.0 / 4.0, Cumulative GPA: 3.86 / 4.0 (Dean's Honour List) (4 years + Co-op year)

Work Experience

Software Development Intern, *CentML,* Toronto, ON **Sep 2023 - Aug 2024**

CentML develops tools to make machine learning (ML) inference and deployment more affordable and efficient.

- Sole contributor of **PyTorch** model remote compilation project (**Docker, AWS, k8s**) for deployment optimization on CentML's cloud-hosted, distributed platform.
- Designed ML model compilation caching system, to reduce costs and improve user experience (**Postgres, S3**).
- Enabled developer workflows with a local compilation server, which is hostable via public client (**Python**).
- Developed a method to consistently hash ML models, including **LLMs** and **CNNs**.
- Added end-to-end testing support to CentML's platform. Wrote compilation server tests using this system.

Undergraduate Research Student, *James Elder, York University,* Toronto, ON **May - Aug 2023**

The Elder Lab is investigating using **image semantics** (classification of objects in an image) to improve computer vision monocular **depth estimation**. This has applications in self-driving cars, robotics, and more.

- Formulated methods to apply Elder's model to enhance existing ML depth estimation solutions.
- Demonstrated ∼**20%** accuracy improvement over previous depth estimation models (**Python**).
- Awarded **Student Choice Best Presentation** at the Lassonde Undergraduate Research Conference.

Software Engineer Intern, *PointClickCare (PCC),* Toronto, ON **May - Aug 2022**

PCC creates healthcare software to assist vulnerable populations with out-of-hospital care.

- Wrote front-end code to ease the editing of patient screening templates (**TypeScript**, **React**). Several internal users mentioned improved usability from my work.
- Extracted and sent user metrics to PCC's Pendo analytics and workflow improvements system.

Data Management Intern, *Independent Electricity System Operator (IESO),* Toronto, ON **Jun - Aug 2021**

As the Crown corporation responsible for operating/directing the electricity market in Ontario, the IESO gathers and monitors data from industrial customers throughout the province.

- Spearheaded **machine learning** project for anomaly detection, using IESO's historical datasets.
- Prepared presentation to highlight uses of **supervised learning** to improve existing processes.
- Performed in-depth review of Meter Service Provider data, for meter billing report correctness.

Extra Curriculars

aUToronto Planning Team Member, *UofT Self-Driving Car Team,* Toronto, ON **Sep 2023 - May 2024**

The aUToronto planning team develops navigation algorithms for autonomous vehicles.

- Implemented method (**C++, ROS2**) to find the fastest route to the nearest empty parking spot.
- Proposed and implemented a technique to reduce map density, improving planning performance >**20%**.

UTSM Electrical Team Member, *UofT Supermileage Team*, Toronto, ON **Nov 2021 - May 2022**

UTSM is a student team dedicated to designing and building a highly fuel-efficient vehicle. I contributed to projects on the electrical system design, including the turning indicators and windshield wipers.

Conferences

York Undergraduate Research Conference, Toronto, ON **Aug 2024**

- Oral Presentation: "Improving Deep learning Depth Estimation models Using Image Semantics and Geometry".
- Recieved the **Student Choice Best Presentation** award.

Projects

Programmable Compass **April 2023**

- Used a GPS module to receive and parse location data using USART communication and Direct Memory Access.
- Communicated via I2C with a magnetonomer to read magnet field data to determine my compass' orientation.
- Used Pulse-Width-Modulation to display the direction and distance to the programmed location on a LED ring.

Radio Transceiver **Jan - Apr 2022**

- Designed limiter, filter, mixer, and amplifier receiver circuits for a radio receiver (**Altium**, **Multisim**).
- Demonstrated successful integration of our subcircuits into a functioning radio transceiver.
- Communicated design rationale to technical and non-technical audiences through presentations.

OS161 (Operating System) **Jan 2023 - April 2023**

- Implemented **memory management**, page reclamation (two-level page table), demand paging, and page swapping with disk.
- Created core system calls for user programs including waitpid, fork, and exec.
- Added key synchronization primitives such as locks and condition variables.

ML Model for Circuit Identification **Jan 2023 - Apr 2023**

- Created a **Convolutional Autoencoder Model** (**PyTorch**) to segment circuits drawings into different modules.
- Achieved a **45% accuracy**, representing a **200% increase** from the baseline.
- Wrote scripts to prepare circuit image data for training, applying transformations to increase dataset size.

Digital Camera Optimization **Mar 2023 - Apr 2023**

- Interfaced with a camera module to display a video stream, using a **STM32 microcontroller**.
- Achieved a **680%** FPS improvement using data truncation, **run-length encoding** and **delta frames**.

Other

Citizenship: Canadian and American
Languages: English (Native Proficiency), French (Native Proficiency), Polish (Beginner)

References

Anand Jayarajan, Co-founder and Chief Architect at CentML.
Email: anandj@centml.ai

Dr. James Elder, Professor at York University, York Research Chair in Human and Computer Vision.
Email: jelder@yorku.ca