

# LAWRENCE TSAI

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## EDUCATION

University of Illinois Urbana-Champaign  
MCS Candidate, cGPA: 4.00

January 2024 - Present  
Urbana-Champaign, IL, USA

University of Toronto - Trinity College  
HBSc - Math (Major), Physics (Major), Computer Science (Minor) with Distinction

September 2020 - December 2023  
Toronto, ON, Canada

· **Graduate Coursework:** K-Theory & C\* Algebras, High Energy Physics, Formal Methods in Software Design

Council Rock High School North  
Diploma with Distinguished Honours in Gifted Program GPA: 4.283/4.0 SAT: 1580/1600 ACT: 35/36

August 2016 - June 2020  
Newtown, PA, USA

## PROFESSIONAL/RELEVANT EXPERIENCE

Capital One  
Software Engineer

February 2024 - Present  
Manhattan, New York City, NY, USA

- Developing a **Distributed REST API** in **Golang** that interacts with frontend inputs to decision **XX thousand card applications daily**
- Working with many downstream APIs to design/implement features to onboard new cards, create end-to-end tests, and support production
- Maintaining backwards compatability while implementing/testing performance enhancements with downstream integrations and concurrency

Capital One  
Software Engineer Intern

June 2023 - August 2023  
Manhattan, New York City, NY, USA

- On the **Payments Intelligence** Team working on migrating transaction cache data from **Redis** to **DynamoDB** to save **\$100,000+** annually
- **Redesigning & Implementing** the database for millisecond(s) latency for our ML model for over **240 billion transactions** annually
- Working with a **gRPC API** with **Jenkins** and utilizing **AWS** Products such as **DynamoDB, EC2, ECS, Fargate, S3, Boto3**
- First Place out of 36 teams in Intern Hackathon, created a Slackbot to summarize messages using **NLP** and **ML** over a weekend

University of Toronto Biology Information Technology Department  
Information Technology Support Assistant

September 2022 - April 2023  
Toronto, ON Canada

- Working with **Linux** environments, **TCP/IP** Protocols, & **Bash** scripting to create embedded systems for the department
- Maintaining department hardware and conducting **Penetration Tests** to find vulnerabilities in for 3 biological science departments

Promise Robotics  
Software Engineer Intern

May 2022 - August 2022  
Edmonton, AB, Canada

- Company's first intern working with **Python, Django, Robotics, CAD, Databases** over 16 weeks; <https://promisrobotics.com/>
- Top intern contributor in creating algorithms for robotic preprocessing/sequencing with applied Physics and **ML** for automated construction
- Developed the **full-stack API** with UI and robotic code outputs to run physical demonstrations of our **MVP for seed investors**

University of Toronto Aerospace Team  
Space Systems Optics Team Member

May 2022 - May 2023  
Toronto, ON, Canada

- Development of a hyperspectral imaging CubeSat to measure anthropogenic gas emissions across Ontario, Canada. Set to launch in 2025.
- Numerical analysis (**Python**) and R&D for optical components (grisms and holographic gratings); Github: <https://github.com/spacesys-finch>
- Leading a team to design test plans for the optical bench (imaging, components, MTF) for the satellite; <https://www.utat.ca/space-systems>

Blue Sky Solar Racing  
Senior Strategy Engineer

May 2021 - April 2023  
Toronto, ON, Canada

- Optimized the construction, telemetry, & performance of our solar car for the American and World Solar Competition along with fabrication
- Conducted research on the implementation of bifacial solar cells and created simulations of cell output from weather and geographic data
- Created a parallel computed simulation (**MATLAB, Python, Ansys, CAD**) in a StratApp for future gens; <http://blueskysolar.utoronto.ca/>

## PROJECTS

Quick Ocular Movements Detection

July 2022-August 2022

- A webcam screening tool to detect strabismus (eye misalignment) for Dr. Etienne Benard-Seguin and Jeremy Moreau (University of Calgary)
- Used **Python, OpenCV, MediaPipe, React, Node.js, CSS, HTML, Figma** to give results at 4 mm tolerance at 95% confidence
- Conducted medical research and pitched to Neurotech professionals; Github: <https://github.com/lt77777/Quick-Ocular-Movements-Detection>

Amigos Friend Making Webapp

September 2021-December 2021

- A webapp built using **Java, Spring Framework, Javascript, CSS, HTML, Figma** to find matches in a database of potential friends
- Implemented a weighted matching algorithm using user metadata to be used through **Thymeleaf** generated webpages deployed on **Azure**
- Designed the entire software model and frontend design to achieve an A in the course; Github: <https://github.com/lt77777/Amigos-App>

## SKILLS

Software Skills      GoLang, Python, AWS, Java, C, Databases, Distributed Systems, MATLAB, Django, Docker, Figma  
Certifications      Bloomberg Market Concepts, AWS Solutions Architect - Associate