RYAN LUU

520-360-7716 ◇ ryanluu52@arizona.edu ◇ https://github.com/rluuy ◇ https://www.linkedin.com/in/rluu52/

SUMMARY

Machine Learning Engineer pursuing a Ph.D. in Optical Science, with a strong background in Computer Science and Mathematics. Adept at developing advanced ML models, analyzing complex datasets, and leading interdisciplinary teams. Proven success in enhancing project outcomes, working hard to understand problems with little domain knowledge, and driving innovation across various fields.

EDUCATION

University of Arizona - Wynatt College of Optical Engineering — Tucson, Arizona
PH.D. in Optical Science — Aug 2024-Present

University of Southern California - Viterbi School of Engineering — Los Angeles, California
Masters of Science: Computer Science — Aug 2021-Dec 2023

University of Arizona - W.A. Franke Honors College — Tucson, Arizona
Bachelor of Science: Computer Science — Aug 2016-May 2021
Bachelor of Arts: Mathematics
Bachelor of Arts: East Asian Studies (Japanese Language Emphasis)
Graduated Magma Cum Laude, Wildcat Excellence Scholarship Award.

Waseda University - 早稲田大学 — Tokyo, Japan
Study Abroad Program in Japanese Language and Economics — May 2018-Jul 2018

TECHNICAL SKILLS

Programming Languages:	Python, Java, C, CUDA, HTML/CSS/Javascript, SQL
Machine Learning Libraries:	Scikit-learn, Pytorch, Hugging-Face
Tools:	Zemax, Visual Studio, Linux/UNIX, Git, , Eclipse, Slack, OnShape CAD, Pandas
Spoken Languages:	English (Native), Vietnamese (Fluent), Japanese (Advanced)

EXPERIENCE

Large Optics Fabrication and Testing Group — May 2022-Current
Graduate Research Assistant, Wyant College of Optical Sciences, Advisor: Dr.Daewook Kim — *Tucson, Arizona*

- Researched into applications of Machine Learning to real world projects in industrial and astronomical optics.
- Successfully accelerated Controlled Computer Optical Surfacing algorithm by over 95%, allowing it to run on consumer hardware.
- Prototyped a Convolutional Neural Network model to aid in error analysis and manual readjustment of misalignment on the Large Binocular Telescope, a telescope with two 8.4 meter primary mirrors.
- Collaborated with a team of Optical Scientist and Astronomers on Project Nautilus, a project to build a brand new concept array telescope capable of studying a thousand earth-like planets.
- Designed an alignment mechanism utilizing CAD that kinematically engages lens segments found on the Nautilus telescope.
- Assembled the prototype telescope with hands-on skills such as machining, tolerance testing, and 3D-printing.

Lightsense Technology Inc — June 2023-June 2024
Machine Learning Engineer — *Tucson, Arizona*

- Applied advanced machine learning techniques to analyze and interpret fluorescence data for miniaturized spectrometer products at startup company.
- Developed and implemented robust linear machine learning models using Python, PyTorch, and scikit-learn, enhancing data classification, feature selection, and prediction accuracy.
- Utilized AutoML techniques and Jupyter Notebook to visualize and analyze complex Emission Excitation Matrix datasets.
- Conducted data acquisition by operating various fluorometers and spectrometers, including solution preparation and practical application in data collection.
- Led a team of 6 student engineers as Project Sponsor, achieving a 90% improvement in manufacturing time, along with enhanced device alignment efficiency and waterproofing for new proof-of-concept F1 Drug Detector.
- Engineered an optical alignment system with Arduino and Stepper Motor technologies for calibrating the F1 DrugDetector.

· Assembled F1 Drug Detector units from scratch, leveraging soldering expertise and software calibration skills.

Black Hole PIRE Lab Aug 2021-Dec 2021
Undergraduate Research Assistant; Advisor: Dr.Chi-Kwan Chan *Tucson, Arizona*

· Developed a production grade quality cloud computing environment within a multi-disciplinary team to support cutting edge astronomy research on the black hole with technologies such as Docker and Kubernetes.
· Created a preliminary neural network auto-encoder to assist in removing noise in black hole images.

Architecture Driven Systems Lab Jan 2020-May 2020
Undergraduate Research Assistant; Advisor: Dr.David Gross *Tucson, Arizona*

· Coordinated together with a team of System Engineers and Computer Scientists to build an in-house Simulation Engine and Architecture Creation Tool from the ground up.
· Directed team as Scrum Master by spearheading Daily Standups, Sprint Planning, Backlog Refinement, Sprint Review, and Retrospective.
· Performed trade studies in order to best determine technologies for ADSL projects.

Teacher Assistant for Object Oriented Programming and Design Aug 2019-May 2020
Undergraduate Teacher Assistant *Tucson, Arizona*

· Emphasized teaching clean code practices, implementing modular design patterns, and well thought out test cases for an upper division class of 160-180 students.
· Enhanced students understanding of JUnit branch coverage by designing assignments requiring 100% branch coverage.
· Collaborated with a fellow TA to write and code a graphical based Madlibs assignment for students using Object Oriented Programming Design, POS tagging with the Brown Corpus, and Java Regular Expressions.
· Held weekly office hours to aid students in programming assignments.

Professional Private Tutor for Mathematics Aug 2017-May 2021
Undergraduate Tutor *Tucson, Arizona*

· Taught within schools for one semester before gaining certification to be added onto the University of Arizona's private tutor list.
· Tutored multiple students in topics ranging from Algebra I to Calculus I.
· Improved students grades on exams by 10-30% percent from previous scores.

PUBLICATIONS / RESEARCH

2025

· **Ryan Luu**, Tianyi Wang, Vipender Negi, Heejoo Choi, Xiangyu Guo, Xiaolong Ke, Lei Huang, Corey Austin, Mourad Idir, Daewook Kim, "Optimizing dwell time matrix computations: a GPU-accelerated approach for CCOS," Proc. SPIE 13624-86, Astronomical Applications (2025).
· Vipender S. Negi, **Ryan Luu**, Tianyi Wang, Hyukmo Kang, Xiangyu Guo, Corey Austin, Xiaolong Ke, Heejoo Choi, Lei Huang, Mourad Idir, Daewook Kim, "Parallel dwell time optimization in zonal optics fabrication for large mirror polishing," Proc. SPIE 13624-50, Astronomical Applications (2025).
· Vipender S. Negi, Hyukmo Kang, **Ryan Luu**, Xiangyu Guo, Tianyi Wang, Corey Austin, Xiaolong Ke, Heejoo Choi, Lei Huang, Mourad Idir, Daewook Kim, "Polishing thin cordierite substrates using diamond particles and cerium oxide for high-precision optical applications," Proc. SPIE 13624-51, Astronomical Applications (2025).

2022

· Marcos A. Esparza, **Ryan Luu**, Heejoo Choi, Tom D. Milster, Daniel Apai, Daewook Kim, "Progress towards alignment of Multi-Order Diffractive Engineered (MODE) lens segments using the Kinematically-Engaged Yoke System (KEYS) for optical performance testing," Proc. SPIE 12221, Optical Manufacturing and Testing XIV, (2022).
· Heejoo Choi, Marcos A. Esparza, **Ryan Luu**, Tom Milster, Daniel Apai, Daewook Kim, "Autonomous closed-loop control for multi-segmented optic aligning and assembly," Proc. SPIE 12221, Optical Manufacturing and Testing XIV, (2022).

2021

· **Ryan Luu**, Joshua Schlachet, Nathaniel Smith, "Multilateralism Shifts: A Study of Japanese Foreign Policy," W.A Franke Honors College Thesis Repository, (2021).

PROJECTS

East Asian Sharing Language Association (EASLA) Aug 2021–Present
Technology Lead, Language Host, Co-Founder
www.easla.org

- Co-founded EASLA, a student-run organization promoting Japanese-English language exchange, with a user base of over 100 active participants across multiple time zones.
- Designed and developed the official website using Angular and TypeScript, focusing on accessibility, mobile responsiveness, and international usability.
- Integrated Google Calendar API to display upcoming Zoom-based language exchange sessions, enabling users to join directly from the site.
- Engineered an auto time zone detection feature that dynamically adjusts event times based on the user's device settings, ensuring clarity for a global audience.
- Deployed the site via AWS Amplify, enabling CI/CD, custom domain management, and scalable hosting.

Master Trader – HackAZ 2025 Mar 2025
Lead Developer
master-trader.net | GitHub | YouTube Demo

- Developed a full-stack financial simulation platform during HackAZ 2025 with a cross-disciplinary team of students in Marketing, MIS, and Information Science (ISTA).
- Built a React-based frontend hosted on AWS Amplify, delivering real-time insights and interactive trader performance visualization.
- Architected serverless infrastructure using AWS Lambda and API Gateway to serve RESTful endpoints for dynamic market recommendations.
- Scraped and integrated congressional trading data from CapitolTrades.com into AWS S3 and DynamoDB, enabling real-time query access.
- Designed modular Python trader agents to simulate diverse market strategies and behavioral profiles in controlled experiments.
- Managed CI/CD deployment, version control, and team workflow via GitHub for rapid iteration throughout the 36-hour hackathon.

Time to C? – GameJam Project
GitHub | Itch.io *Oct 2024*

- Designed and built a visual novel-style trivia game in Godot during a 48-hour GameJam, focusing on time travel and narrative-driven quiz mechanics.
- Implemented branching dialogue logic, animated character portraits, and trivia state progression using GDScript.
- Handled UI layout, scene transitions, and event triggers to create a polished and immersive player experience under tight development constraints.

Naturalization of Text: Inserting Disfluencies with Deep Learning
https://github.com/parthvshah/naturalization-usc *May 2023*

- Successfully implemented techniques to transform raw spoken dialogue text into a natural-sounding spoken version by adding disfluencies with two methods for text naturalization.
  1. **Bigram Approach**: Used frequency of bigrams in training data to determine where to insert filler words or pauses in input sentences.
  2. **Transformer-Based Method**: Employed a transformer model to identify the most probable insertion points and disfluencies.
- Evaluated model performance with two automated scoring systems: similar sentence score and similar insertion score achieving a score of .250 that approaches the gold standard of .406.
- Created a live demo of the project using Python, Flask, and HTML.