Lance Ellis

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Education

University of Texas at Austin May 2021 - May 2025
Bachelor of Science in Astronomy

Experience

Amazon May 2022 - August 2022
Software Development Engineering Internship Los Angeles, CA

- Developed linter to validate server-side renderings of the Amazon Alexa app served to tens of millions of users to reduce developer error rate by 30%
- Implemented the linter API with Java using JSON schemas and tree traversal for speeds 10x faster than typical JSON Schema validators
- Created an interactive UI for Amazon Alexa developers, 1000 engineers, to validate and develop Amazon Alexa pages created with TypeScript, React, TailwindCSS, and Recoil for state management

Major League Hacking May 2021 - Aug 2021
Production Engineering Fellowship Remote

- Certified by the Linux Foundation in the essentials of system administration learning DevOps technologies: Docker, AWS, Bash, Python, and Linux
- Built full-stack Instagram clone using Flask and MongoDB for the user database
- Deployed app on an AWS EC2 using Docker-compose to containerize the app and orchestrate containers for monitoring using cAdvisor, reverse-proxying using Nginx, and data analytics using Prometheus visualized with Grafana
- Implemented CI/CD; automated linting, unit and integration testing, and deployment using GitHub Actions

Trinity University June 2020 - June 2021
Computer Science Research Internship San Antonio, TX

- Second author of Photometric Renderings of Dust and Freed Regolith in Ring Simulations
- Engineered realistic 8,000,000 particle n-body simulation of Saturn's rings to have accurate photometric renderings of dust and freed regolith in Scala using the Monte Carlo method
- Enhanced rendering time by 6,400% by implementing parallelism on the K-D tree used to store the bodies

Projects

Hackathon Project git.io/tabforcharity
Tab for Charity, Full-stack App

- Next.js full-stack web application mines cryptocurrency when users idle for charity donations
- Mines Monero efficiently using Web Assembly to generate 2 dollars per 1000 users per day
- Sign-in authorization through Google OAuth, hosted with Vercel, and Mongoose ORM for database

Personal Project git.io/lemma
Lemma, Language Parser

- Built CLI parser using ANTLR4 to develop hard-typed language for units and functions
- Computes various quantum optics phenomena like polarizing beam splitters, BB84, B92, Malus' Law, with additional math functions for concepts like binary one-time pad

School Project git.io/Reservoir-development-simulation
Inventors Program, Machine Learning Algorithm for Identifying Oil Wells

- Developed Pix2Pix model to identify wells using satellite image data to predict future well development
- Partnered with ConocoPhillips to train the model using DBSCAN to get an MAE of .772 and MSE of 3.8 on validation data

Other Projects

- **Personal Website :** Full-stack Next.js web app built using React

Technical Skills

Programming Languages: C++, JavaScript, Python, Java
Web Technologies: Django, TypeScript, React, Next.js
DevOps: AWS, Lambda Functions, GitHub Actions, Docker
Miscellaneous: SQL, Git, Bash, Latex, Tauri, MongoDB

Relevant Coursework

Computer Science: Data Structures & Algorithms, Web Development, Quantum Computing
Mathematics: Calculus 2 & 3, Linear Algebra, Differential Equations with Linear Algebra