Jadyn Naquib Chowdhury

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Education

University of Illinois at Urbana-Champaign **August 2021 – 2025**
Bachelor of Science in Computer Science *Champaign, Illinois*
Bachelor of Science in Aerospace Engineering
Grainger College of Engineering James Scholar and Honors Student

CS Coursework: Discrete Structures, Data Structures, Probability and Statistics for CS, Algorithms and Models of Computation, Computer Architecture, Artificial Intelligence, Software Design Lab, Advanced Numerical Analysis, Program Languages and Compilers, CS Law and Ethical Conduct, System Programming, Software Engineering
AE Coursework: Flight Mechanics, Thermodynamics, Statics, Control Systems, Dynamical Systems, Autonomous Systems Lab, Introduction to Robotics

Projects

Portfolio Optimization Model Using 2D Relative-Attentional Gated Transformer **May 2024 – Present**
Backend Machine Learning Developer *Champaign, Illinois*
- Developing a transformer-based model to optimize portfolio allocation by analyzing historical stock data, incorporating OHLC prices, trading volumes, liquidity constraints, and market impact costs to enhance trading decisions.
- Implementing data processing pipelines, hyperparameter tuning, and advanced model architectures, improving predictive accuracy while balancing risk and return for real-world portfolio management applications thereby gaining in-depth knowledge of financial markets, concepts and relationships.

React-Based E-Commerce Platform with Integrated AI Assistant **March 2024 – April 2024**
Full-Stack Web Developer *Champaign, Illinois*
- Developed a React-based e-commerce platform focusing on groceries, integrating dummyJSON API for product management and OpenAI's GPT-3 API for an AI-powered virtual assistant named Lucy, which provides recipe suggestions and ingredient management based on user cart contents.
- Implemented advanced features including product search, cart management, and dynamic content rendering using Axios for API calls, React Router for navigation, and custom hooks for state management, ensuring an intuitive and responsive user interface.

AI Shapeshifting Alien Maze Solver **September 2023 – October 2023**
Backend Developer *Champaign, Illinois*
- Implemented a Python-based algorithm transforming a shapeshifting alien path planning problem into a graph search problem, utilizing a modified A* algorithm for three-dimensional state representation including position and shape.
- Created geometry functions to validate straight-line paths, avoiding obstacles and workspace boundaries, and adapted state representation to account for the alien robot's three forms and movement restrictions.

Autonomous Drone Simulation **October 2023 – December 2023**
Backend Numerical Analysis and Frontend Simulation *Champaign, Illinois*
- Designed and simulated a control system in Python enabling a quadrotor drone to autonomously navigate a complex obstacle course by linearizing a 12-state model of quadrotor dynamics through Jacobian analysis.
- Analyzed position data to validate completion time under 30 seconds and collision-free flight and evaluated limitations by varying mass payload and course parameters to then author a detailed academic report with theoretical foundations, mathematical modeling, and results/analysis.

Image Classification Neural Network **November 2023 – December 2023**
Backend Developer *Champaign, Illinois*
- Developed and enhanced a neural network in PyTorch for classifying images into four categories by integrating convolutional neural network layers for spatial feature extraction in image data and optimizing with varied activation functions, and network architecture adjustments.
- Ensured robust model generalization through L2 regularization and parameter tuning, while maintaining computational efficiency within a 500,000-value parameter constraint.

Experience

Illini Formula Electric **August 2021 – Present**
Member of Software Team *Urbana, Illinois*
- Engineering, designing, building, and marketing an all-electric formula racecar for international and local competitions in NA that enables a multifaceted approach in the field through real world application of individual skills within a community and common goal.
- Implementing automated 4WD in the car with the software team in the aim of optimizing motor and vehicle efficiency.
- Used python simulations of the vehicle to test algorithms that are then implemented alongside the electrical design team and updated through lab testing.

Illinois Space Society **August 2021 – Present**
Member of Avionics Team *Urbana, Illinois*
- Working with academics and industry professions in a community of over 200 individuals running diverse technical aerospace projects that encourage field proficiency and drive education outreach through its members and teams.
- Managing the CPU and avionics systems of the rocket in project SpaceShot, the first student lead solid fuel rocket to reach the Kármán line.

DataSoft Systems **May 2023 – December 2023**
Full-Stack Software Engineer *Remote*
- Engineered a cutting-edge CRM system with advanced machine learning algorithms, utilizing Python and SQL for robust data analytics.
- Crafted an intuitive front-end user interface, fostering a seamless and user-friendly experience.
- Conducted in-depth data analysis, leveraging machine learning to uncover actionable insights, propelling data-driven decision-making, and strategic planning.

Taiba Medical Centre **April 2020 – August 2020**
Lead Full-Stack Software Engineer *Nairobi, Kenya*
- Volunteered at Taiba Medical Centre which, in partnership with the NGOs Bela Risu Foundation and Operation Blessing, works in several countries in Africa and offering surgeries on craniofacial deformities to people with no or limited access to health care.
- Replaced clinics dated paper filing system with an EHR from scratch using Python, Java Script, CSS and HTML as well as open-source SQL databases on a Django framework to develop and demonstrate a health record system.
- Integrated novelle system architecture independent to existing EHRs such that the clinic had full rights and access to the system.

Skills

Languages: C++, C, Python, data analysis and physics computational models, Java Script, HTML, Kotlin, SQL, Batch Script, OCaml
Tools: Django, Flask, AWS and Cloud Services, Docker, Numerical Methods, React.js, Git, Financial Applications, Engineering Applications