HYDER MOHYUDDIN

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United States Citizen; eligible to work in the **United Kingdom under the UK HPI visa** *(valid for 2 years)*

EDUCATION

Bachelor of Science, Major: Computer Science, Minor: Visual Arts, University of Chicago Mar 2025

Coursework: Data Visualization, Theory of Algorithms, Discrete Math (Matrix Math), Systems Programming II, Complexity Theory, Data Science I (Pandas and Statistics), Art & Machine Intelligence, Advanced Conceptual Drawing, Actuated User Interfaces and Technology, Inventing, Engineering and Understanding Interactive Devices

COMPUTER SKILLS

Programming Languages: Python, Java, JavaScript, Assembly, C, C#, REACT, Complex OOP
Web Development: HTML, CSS, JavaScript, jQuery, Website Builders Figma and Squarespace
3D Modeling & Prototyping: Autodesk Fusion, 3D printing, hardware integration with Arduino & electronic
AI & Machine Learning: Proficient in PyTorch and Stable Diffusion for generative AI and model optimization

WORK EXPERIENCE

Stable Diffusion Project, University of Chicago, IL Dec 2023-Present

Software Engineering & Optimization

- Enhanced system scalability, privacy, and security by architecting and leading the development of a Python server with secure authentication, and protecting against reverse engineering through code obfuscation techniques.
- Explored new possibilities in diffusion model generation by designing and building an out-facing web interface, handling all aspects of software development, including back-end, front-end, model control, and quality assurance.
- Achieved efficient string matching and trie-based compression by developing optimization algorithms, and enabled the exploration of randomized algebraic expressions in machine learning model transformations.
- Enhanced Stable Diffusion software with custom memory management, enabling real-time tensor adjustments and improving processing efficiency.
- Developed systems to improve data compression, storage efficiency, and model training through optimized file structuring with JSON and YAML.

Model Manipulation & AI Research

- Developed research tools for tensor modification, including random formula generation to create diverse image outputs and used AI to filter results based on similarity and novelty.
- Created an intuitive system for targeting specific model layers, enabling controlled modifications to fine-tune generative outputs.
- Engineered tools for interpolation and precise modification of small elements in generated images, allowing systematic experimentation with variations.
- Designed a method to layer Voronoi patterns across multiple generations, enabling ultra-high-resolution image creation beyond standard software limits.
- Built logging and analysis systems to track weight and bias factors, measuring average modifications, standard deviations, and trends to extract meaningful insights from model behavior.

Interface & Collaboration

- Enhanced functionality by implementing the SPIM(Salavon's Pathology Inducing Machine) interactive React application for visual data on Professor Salavon’s website and developing Python GUIs to test render parameters.
- Created unique visual effects by developing media manipulation tools using randomized filters and Voronoi tessellations.
- Managed effective web styling by delegating tasks to a junior designer (a Computer Science master’s student at the University of Chicago) during a two-month collaboration.

Software Project Lead, University of Chicago Booth School of Business, Chicago, IL Dec 2023-Nov 2024

- Streamlined transformation tasks by automating the processing of compiled SQL data using Python.
- Enabled interactive visualization of environmental data on a dynamic globe using JavaScript and 3js.
- Improved statistical analysis efficiency by developing features to partition, average, and divide data clusters.
- Enabled seamless visualization of 200GB of environmental data on the globe using 3js by implementing functionality for dynamic data visualization with different Leaflet palettes.
- Drove team alignment on next steps by leading weekly progress updates and summarizing key advancements.

Tutor, Chicago, IL 2016-Present

- Self-employed Tutor: provided 1,000+ hours of individualized instruction to 50+ middle-school, high-school, and college students in math, physics, chemistry, and essay-writing.
- Code Platoon (NGO): Assisted in teaching coding bootcamp for evenings/weekends with 30 veterans and active duty service members.
- Code Your Dreams (NGO): Taught a 7-week introductory coding course to 40 inner-city high school students and trained inner-city high schoolers in *Youth Initiated Mentoring* for building relationships with non-parental adults
- Taught coding principles using MIT App Inventor, a high-level block-based visual programming language.

Technology Support Assistant, University of Chicago Humanities Computing 2018-2021

- Provided in-person computer configuration and IT Troubleshooting services to faculty and staff.
- Imaged, setup security and maintained software applications for 100+ Humanities Division computers.
- Automated OS and mandatory applications for University Computers.

VOLUNTEER EXPERIENCE

Founder, Justice Lecture Series Club, University of Chicago Laboratory Schools 2017-2018

- Completed Harvard University's online 24-session course '*Justice with Michael Sandel*'
- Using course teaching material, organized 24 after-school sessions for students to view lecture videos and led discussions for students to apply theories of justice to current legal and political controversies

Squash Coach, MetroSquash (Chicago Non-profit) 2012-2016

- Volunteered weekly in after-school squash training for inner-city elementary and high school students.
- Originated proposal to start an online, student-run, squash shop to develop job skills in web and graphic design, accounting, marketing, and operations management.

INTERESTS

Languages: English (fluent), Gujarati (fluent), Hindi (intermediate), French (intermediate), Arabic (beginner), Japanese (beginner – Kanji, Hiragana, Katakana)
Arts: Digital art, pencil sketching, stencil design, 3D design and printing, painting
Activities: squash, skiing, biking, chess, video games