KUSHAGRA SRIVASTAVA

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EDUCATION

UNIVERSITY OF MASSACHUSETTS AMHERST Amherst, MA

Bachelor of Science w/ Multidisciplinary Honors | Major in Computer Science May 2024

Cumulative GPA: 3.6/4.0; Dean's List; Received Chancellor's Scholarship for Merit Based Achievements during High School.

Relevant Coursework: Data Structures; Computer Systems; Reasoning Under Uncertainty (Statistics, Probability); Programming Methodology; Algorithms; AI/ML; Web and Software Dev; Operating Systems; Networks; Quantum Computation

Honors Thesis: Comparing Performance Differences Between RUST and C++

Awarded "Commonwealth Honors College Scholar With Great Distinction."

Clubs: Google Developer Student Clubs, UMass Student Alumni Association, UMass PITCH (Performing Live Music)

COLLEGE OF NATURAL SCIENCES AT UMASS AMHERST Nov 2020 - May 2024

- Integrated Concentration in Sciences; a 20-Credit Research Based Undertaking backed by UMass College of Natural Sciences.
- Published 4 research projects on the UMass Amherst website, compiled here; skushagra.com/docs/research/iCons

EXPERIENCE

PSIVANT THERAPEUTICS Boston, MA

Systems and Software Developer | github.com/psivant/stormm June 2024 - Present

- Aided in developing STORMM: A High Performance Molecular Dynamics Framework written on C++ and Nvidia CUDA.
- Developing Replica Exchange Molecular Dynamics: a computational framework that examines molecular simulations in parallel threads, using simulation temperatures and/or particle hamiltonians as a primary differentiator between simultaneous replicas.
- Handling C++ 17 and CUDA 17 standardization across all UNIX[-like] platforms, and native Windows compilations.
- Created over 1700 test cases and counting to ensure STORMM's REMD protocols follow the industry standard: including testing for safe multithreading, handling split fixed precision math in extreme cases, seamless error reporting and handling, and more.

CICS SYSLAB Amherst, MA

Researcher | tra86.skushagra.com Feb 2023 - May 2024

- Created a Systems Design and Architecture Lab with Prof. Joe Chiu, Prof. Timothy Richards, and 5 other CICS students.
- **Hons. Thesis** research work include a performance analysis of the RUST Compiler w.r.t. the GNU/GCC Compiler, utilizing various x86 Assembly Tracing methods to analyze certain performance metrics on low-level code for each language.

SMITH COLLEGE Northampton, MA

Research Assistant | geometry.cs.umass.edu Oct 2022 - June 2024

- Assisting in the Software Development part of the current research under the guidance of Dr. Ileana Streinu at LinKaGe Lab.
- Optimizing systems and servers to ensure the lab's software programs work efficiently, as well as ensuring upkeep, and security.
- Technologies in use: C, Java Servlets, and Python, along with a heavy utilization of UNIX CLI programs and server systems.

FN MATHLOGIC CONSULTING SERVICES Gurugaon, India

Machine Learning Intern Jun 2022 - Aug 2022

- Constructed, trained, analyzed, and optimized Neural Networks on tabular, and image based datasets via TensorFlow and Keras.
- Achieved high accuracy levels on the MNIST Database (96.21%), VisualQA (94.56%), and datasets reflecting market conditions.
- Performed data rollups at customer level, resource allocation, neural network construction and optimization, and ensemble machine learning for predicting credit card defaults in a Kaggle Competition with American Express with a 92% accuracy.

THE INDIAN HIGH SCHOOL Dubai, U.A.E.

IT Specialist & Trainer | alumni.ihsdubai.org Apr 2020 - Aug 2020

- Led a team of 14 graduates to develop an app (Android & iOS) using Kotlin, Swift, Firebase, and Flutter in 3 weeks.
- Integrated it with Microsoft 365 to move coursework for 4500+ students. Trained 150 Faculty Members on using the app.
- Implemented and tested the authentication system of the school's Alumni Portal using Django, Python, and SQL.

TATA CONSULTANCY SERVICES Dubai, U.A.E.

Software Developer Intern May 2019 - Aug 2019

- Designed a platform in 6 weeks for a Food Company (Kout Food Group) to digitize the infrastructure across 19 branches.
- Used AWS, SQL, and Hadoop to develop a platform to manage the inventory and daily activities, with real time tracking.
- Deployed the product's initial phase in under 2 weeks, as well as devised a 6-month migration plan to turn 100% digital.

iConS RESEARCH

iConS + DOE: The Opportunity Project | suobset.github.io/assert

- Collaborative Project with The U.S. Department of Energy, The U.S. Census Department, and the UMass iCons program.
- Creating an AI-Based GIS-tool - ASSERT - which maps the areas with populations overburdened by electrical outages, in order for Emergency Response teams like National Grid direct resources to those areas.

iConS 3: The Cost of Control | suobset.github.io/iCons3

- iConS 3 Lab Project on Simulating HVAC Energy Costs for Office Spaces and optimizing systems for higher efficiency and savings.

- Programmed the main website to showcase our graphs and results in an interactive manner, and contributed towards the development of HVAC simulation on Simulink along with teammates with a Physics and Electrical Engineering background.

iConS 2: Mapping Transit Accessibility in Boston | suobset.github.io/iCons/iCons2-MoS/redirect

- Collaborated with a team of 5 people to map the Boston Public Metro System, and analyze its accessibility.
- Programmed Interactive Map using GIS and R to showcase accessibility of 162 metro stations, along with real-time on-field data taken in Boston over the span of 2 weeks, backed by MBTA, The Museum of Science at Boston, and UMass CNS.

iConS 2: Assessing the Development of Renewable Energy | suobset.github.io/iCons/iCons2-CS1/redirect

- Launched an interactive website to showcase the development and adoption of Flow Batteries between 2015, predicted until 2027.
- Built interactive graphics using JavaScript, and gave a 10-minute keynote to help the audience interact and experiment with the data.

iConS 1: On Hydrogen Energy | suobset.github.io/iCons/iCons1-CS2

- Coded an interactive website to supplement the poster on how to make Hydrogen Energy more accessible and reliable.
- Used graphs from the U.S. Department of Energy to showcase the growth and distribution of Hydrogen Energy in different U.S. States, along with other self-coded interactive graphs that the audience could use to understand the topic more in-depth.

PROJECTS

MeetU | github.com/suobset/meetu

- Web Based Team Project Management and Scheduling Software created as part of CompSci 326 under Prof. Tim Richards.
- Created the backend and server-side implementations using Node.js, ElephantSQL, Heroku Server, and assisted in frontend with JavaScript, HTML, and CSS. The whole sprint was done in about 6 months, from conceptualization to final product.

DataFest 2023 | science.smith.edu/datafest/

- ASA DataFest 2023 Five Colleges Chapter **Winning Project**: Best in Show and Best Visualization awards.
- Created the NLP part of the ASA Datafest '23 customer-business relational dataset, wherein I analyzed key-words in verbal conversations between customers. This was in-collaboration with the team to create a 3 part trend-analysis dashboard.

MoodMusic | HackUMass IX: 48 hr Hackathon | github.com/suobset/MoodMusic

- React App which integrates with a user's Spotify Account to determine moods of songs being played using a mathematical model.
- Coded mathematical model using NumPy, created API using Flask to bridge between React.js and Python.

On The Move | with Spider Business Consultancy, Dubai | May - Aug 2021

- Developed a web and mobile app to help the company expand their business consultancy services to clients in over 30 countries.
- App leveraged automated recommendations for clients, as well as achieved more interactive and efficient delivery of services.

DermSafe | HackUMass VIII: 48 hr Hackathon | github.com/suobset/hackUmass-VIII-proj-DermSafe

- Android app which determines if an individual has Skin Cancer based on uploaded pictures with an accuracy of 87%.
- Machine Learning Model trained on Tensorflow with 4000 images from ISIC, PH2, and Complete MedNode online databases.

CONFERENCE PRESENTATIONS

- Honors Thesis Presentations, **Commonwealth Honors College.** Amherst, MA, forthcoming May 2024.
- 'Comparing Performance Differences Between RUST and C++', **Massachusetts Undergraduate Research Conference.** Poster Presentation. Amherst, MA, forthcoming April 19 2024.
- 'ASSERT - AI Based Smart Electricity Restoration Tool', **The Opportunity Project 2023, Census Open Innovation Summit.** Research Presentation and Product Demo. Washington D.C., forthcoming January 17 2024.
- 'Alternative Methods of Preprocessing Demand for HVAC Control', **2023 Energy Transition Symposium at UMass Amherst.** Poster Presentation. Amherst, MA, 2023.
- 'Promoting and Showcasing Climate Agency Among Undergraduates Through Multi-Sector Collaboration' **Boston Area Research Initiative,** on behalf of UMass iCons and Museum of Science. Speaker. Boston, MA, 2023

HONORS AND AWARDS

- **iCons Fund for Student-Driven Research Projects,** University of Massachusetts Amherst 2023
- **Museum of Science: Go Carbon Neutral Initiative Fund,** UMass Amherst (via iCons) 2022
- **Chancellor's Scholarship for Undergraduate Students,** University of Massachusetts Amherst 2020 - Present
- **Undergraduate Students' Dean's List,** University of Massachusetts Amherst 2020, 2022, 2024

MEMBERSHIPS

- **American Statistical Association,** Member (as part of DataFest winning prize)
- **Free Software Foundation,** Associate non-voting member and contributor

LANGUAGES

English, Native Proficiency **Hindi,** Native Proficiency **Arabic,** Elementary Proficiency

SKILLS

Programming Languages: Java, Python, SQL, C, C++, JavaScript, R, RUST, Kotlin, Swift, HTML/CSS, x86 Assembly, PHP
Frameworks + Tools: TensorFlow, Keras, Django, Node.js, React, Angular, Numpy, Pandas, Flask, Firebase, Flutter, Git, Cargo
Operating Systems: Linux (Kernel, Ubuntu, RedHat), macOS, Windows Powershell, MIT PDOS xv6 (RISC-V Variant)

REFERENCES

- **Provided upon request**