Manas Vishal

(774) 503-5824 | vishalmanas28@gmail.com | https://www.linkedin.com/in/manasvishal | https://github.com/manasvishal

SKILLS

Programming Languages: Expert in Python, C, C++, R, HTML & TeX and proficient in Julia, SQL & PHP
Computer Software: MATLAB, Mathematica, Origin, Gnuplot, ImageJ, LaTeX, Android Studio

EDUCATION

University of Massachusetts Dartmouth
PhD, Computational Sciences and Engineering (Theoretical Physics) **Expected May 2025**
Award: Distinguished Doctoral Fellowship | GPA: 4.0

Indian Institute of Science Education and Research Kolkata
Bachelor and Master of Science, Physics **June 2021**
Award: Merit-based scholarship | GPA: 3.5

Relevant coursework: Linear algebra, Statistics, Mathematical Modeling, Advanced Machine Learning, Numerical Methods and Algorithms, Computational Physics, High Performance Computing

EXPERIENCE

Center for Scientific Computing and Data Science Research, UMass Dartmouth
Research Assistant **Sep 2021 - Present**

- Formulate a robust mathematical model to simulate astrophysical binaries.
- Develop a codebase with new algorithm from scratch for numerical simulations of astrophysical binaries using high performance mathematical models.
- Prototype MATLAB code runs 90 times faster and 10^8 times more accurate than current state of art
- Assist junior researchers to develop quantitative and analytical skills for black holes simulations.

Advanced Data Mining, UMass Dartmouth
Python Programmer and Data Analyst **Jan 2024 – Apr 2024**

- Spearheaded the team of 3 to analyze credit card fraud data using R and Python
- Curated a codebase using R and Python libraries (Scikit-learn, numpy, pandas, seaborn, matplotlib) to perform a predictive analysis and classify the time series data for fraudulent transaction
- Trained several algorithms like XGBoost, Logistic Regression, Decision Tree, and Neural Networks on the dataset
- Utilized different metrics like F1 Score, AUC ROC, Recall, Precision to benchmark different algorithms, rendering us with a logistic algorithm with 95% accuracy

Albert Einstein Institute, Max Planck Institute of Gravitational Physics, Potsdam, Germany
Data Scientist **Jun 2023 – Jul 2023**

- Accelerated the simulation time of binary black holes using a data driven approach
- Analyzed time series datasets in frequency domain for a faster and efficient surrogate approach
- Polished the algorithm to generate black hole physics data 6 times faster

NSF Careers, Yale Center for Research Computing
High Performance Computing Student Facilitator **May 2023 – Jun 2023**

- Translated a prototype MATLAB code to an efficient C++ codebase
- Benchmarked and profiled C++ codebase across multiple platforms by deploying high performance computing techniques
- Implemented unit and regression tests to the codebase using *Git*

PUBLICATIONS and PRESENTATIONS

- First author paper on highly efficient simulation of astrophysical objects (https://arxiv.org/abs/2307.01349) [with referee]
- Invited talk at MIT on September 11, 2023
- Invited talk at Infinity on a Gridshell workshop held in Copenhagen, Denmark
- Presented my research on astrophysics simulations at Albert Einstein Institute in Potsdam, Germany

AWARDS

Dissertation Research Award
University of Massachusetts Dartmouth **May 2024**
Recognition for exceptional performance in doctorial research in Physics

LISA Symposium Travel Grant
National Aeronautics and Space Administration (NASA) **Apr 2024**
Grant offered to highly motivated scientists to attend the space-borne telescope, LISA, symposium in Dublin, Ireland

Distinguished Doctoral Fellowship
University of Massachusetts Dartmouth **Sep 2021**
Highest fellowship offered to only 10 students by UMass Dartmouth that aided my doctoral research in black hole physics

LEADERSHIP and OUTREACH

- Organized the first ever hackathon of University of Massachusetts Dartmouth on April 13, 2024.
- Led the multimedia and web technology team of Inquivesta, the largest science fest of India. Moreover, developed the android application for the event that handled transactions.
- Utilized python modules (ipyvolume, numpy, matplotlib, scipy, sci-kit-learn, pandas) to analyze the time series data to extract physics of black holes and make Augmented Reality/Virtual Reality simulations that got a first prize in Brown University's hackathon.