Anuradha Agarwal

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I am a driven and well-organized mathematician currently working towards MS in Computational Science/ Data Science; passionate about applying mathematical knowledge to data science, analytics and technology.

EDUCATION

Master of Science in Computational Science, Data Science concentration Aug 2021 - May 2023
San Diego State University (SDSU), California
Bachelor of Arts in Mathematics and Economics Sep 2018 - May 2021
Rutgers University - New Brunswick, New Jersey

TECHNICAL SKILLS

Languages: Python (NumPy, Pandas, Scikit-Learn, Streamlit, Plotly, Matplotlib, PySpark), MATLAB, C, R, SQL, Bash
Other: Tableau, Git, Excel, Adobe creative cloud, Gimp, Krita, Inkscape, Microsoft office, Machine Learning

WORK EXPERIENCE

Research and Development Intern, SDSU Jun 2022 - Aug 2022

- Demonstrated excellent teamwork and collaboration skills by managing a multifaceted mathematical research project at Summer Research Experience while mentoring and training 12 researchers which resulted in 5 conference presentations.
- Designed and validated 4 age-based compartmental models and 4 vector host models, while demonstrating the Practical Identifiability using the Monte Carlo and Profile Likelihood methods and Structural Identifiability using the differential algebra approach.
- Formulated that the complexity of the model and its generalization accuracy can be balanced. Established that the models implemented in this research project produced more accurate results compared to the standard epidemiological models by over 80% of accuracy.

Computational Lab Operations Manager, SDSU Jan 2022 – Present

- High-level strategic planning with 7 agile team members. Building automated testing scripts using PBS and torque reducing manual efforts by 75%. Writing optimized bash scripts for backup of GitHub repositories and clusters, incorporating the 3-2-1 backup policy and installing bioinformatic tools on High Performance Computing clusters.
- Standardizing the organization's website and documenting lab tutorials using YAML and Jekyll. Carrying out administrative duties with professional communication to ensure efficient operation of the Lab by creating roadmaps, problem plans and Trello boards.

Project Management as a Graduate Research Assistant, SDSU Sep 2021 – Present

- Investigating the movement of diffusion of Human Immunodeficiency Virus through mucus in the cervix region using finite differencing numerical methods on MATLAB and Python, funded by the NSF worth $179,990.
- Implementing and validating Partial Differential Equation models to compute time taken by the virus to reach its target and carrying extensive data analysis, which is found to be 13.9 hours which resulted in discovery of preventive nanomedicine, 3 oral and poster presentations, and an award-winning poster competition, CSRC Director's award, at the ACCESS conference.

ACADEMIC PROJECTS

- Analyzed alternative ways to detect language while identifying efficient machine learning algorithms using Scikit learn on python and MLlib in Apache Spark. Discovered that using frequency analysis gives 31% of greater accuracy compared to benchmark libraries.
- Performed data cleaning and analyzed if there was widespread election fraud in the presidential election using python libraries like pandas, NumPy and plotly. Determined that over 92% of districts has unusual voting patterns.
- Optimized solving of the 2D Laplace equation using finite difference and conjugate methods by parallelizing the code on DGX server with OpenAcc and C programing resulting in speed up by 4127 times.

AWARDS AND PRESENTATIONS

- Oral Presentation: Practical Identifiability at the CSU JMM, Northridge [Link] Nov 11, 2022
- CSRC Director's Award – CSRC ACSESS 2022 Apr 08, 2022
- Oral Presentation: HIV in mucus at the CSRC ACSESS 2022 [Link] Mar 20, 2022
- Poster presentation - Student Research Symposium 2022 [Link] Mar 04, 2022