Abhay Kshirsagar

Curriculum Vitae

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Education

2019–Present **Indian Institute of Science Education and Research, Kolkata**,
Dept. Biological Sciences, Minor : Computer Science.
GPA – 8.73/10

Interests and Hobbies

Research Int. I am mainly interested in understanding Biological phenomena through the application of Computational techniques such as deep learning and molecular dynamics simulations.

Hobbies Origami, Programming

Publications

Feb 2023 **Conformational Ensemble of the NSP1 CTD in SARS-Cov2: Perspectives from the Free Energy Landscape**, *Pallab Dutta,* **Abhay Kshirsagar**, *Parth Bibekar, and Neelanjana Sengupta*.
In this Study we investigate the conformational ensemble of NSP1-CTD of SARS-CoV-2 virus by leveraging Enhanced Sampling Method like Replica Exchange Molecular Dynamics and gain insights on its conformational landscape by using methods such as Expectation Maximized Molecular Dynamics.
DOI: 10.1016/j.bpj.2023.02.010

Projects and Experience

Nov 2021 – Present **Exploring the the Free Energy Landscape of IDR**, *Prof. Neelanjana Sengupta, IISER Kolkata, India*.
- Studied the Conformational Landscape of CTD-NSP1 COVID proteins using Molecular Dynamics Simulation and learning the FEL using EMMD.
- Sample the Intermediate Rare Conformations using the latent space.

Jun 2022 – Aug 2022 **NLP Researcher**, *At Wavel.ai*.
Worked in the core team to learn, explore, and build state-of-the-art TTS models for multilingual and multispeaker voice cloning.

Nov 2021 – Dec 2021 **Predicting Global Horizonal Irradiance [Code ,Certificate]**, *Hackathon Submission*.
- Implemented Long Short Term Memory Networks on previous GHI and could cover data of a solar farm.
- Qualified To be Finalist Teams among 30 Teams

Oct 2020 – Nov 2020 **Wind Farm Layout Optimization [Code]**, *Hackathon Submission*.
- Implemented Particle Swarm Optimization Algorithm in Python.
- The algorithm finds the optimal wind turbine farm layout using PSO and Wind Data of a particular region.

Jun 2020 – Nov 2020 **Summer Project [Report]**, *Prof. Jayasri Das Sarma*.
- Studied the parallels between m-CoV and SARS-CoV-2 and how is can be used as a model organism for studying SARS-CoV-2 in mice.

Feb 2020 –
Jun 2020

Welearn Bot [Code], *Team Project*.
- A cli application for interacting with Welearn IISER-Kolkata for downloading files getting assignment deadlines
- Implemented the cache file system for the downloaded files and calendar event creation
- Implemented the google calendar integration for adding assignment and examination deadlines as an event on google calendar for those productivity.

Achievements

Dec 2021 **HPC Hackathon**, *Funding for Research*.
- Our Team won the HPC Hackathon organized by DST-India and Powered by Amazon Web Services
- We received a prize of $10,000 (USD) in compute credits by AWS for our project proposal.

Jun 2020 **KVPY SB Scholar**, *Scholarship*.
- Qualified for a scholarship program for students interested in pursuing science
- Ranked 56

Jun 2019 **INSPIRE Scholar**, *Scholarship*.
- Qualified for a scholarship program for students interested in pursuing science

Skills

Languages Python, C/C++, MATLAB, Dart
Frameworks Keras, PyTorch
Web Dev HTML/CSS, JavaScript
Android Dev Flutter

Relevant Courses

Online Certifications.
- Machine Learning by Andrew Ng - [Certificate]
- Introduction Neural Networks - [Certificate]
- Convolutional Neural Networks - [Certificate]
- Improving Deep Neural Networks: Hyperparameter Tuning, Regularization and Optimization - [Certificate]

Extra Curriculars

Aug 2021 **SlashDot Club**, *Convener*.
- I was the convener of SlashDot Club which is the Coding Club of IISER Kolkata
- During my period I have taken Workshops on Web Development where I taught HTML, CSS and JavaScript.
- I was also an active member of Code Chef College chapter of IISER Kolkata

Jan 2021 **Campus Radio**, *Web Development Team*.
- I headed the Web Development Team at Campus Radio and created website with a database Back-end
- For the Website I used tools like Firebase for storing Images, And personal Data
- I also created an app which connects to the Fire-base with CRUD functions that allows user to Modify the Data seamlessly through the GUI