Rohit Roy

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Education

2019–present **Duke University**, *Durham, NC, USA.*
Ph.D. in Computational Biology and Bioinformatics
Duke Center for Genomic and Computational Biology

2015–2019 **Indian Institute of Technology**, *Kharagpur, WB, India.*
Bachelor of Technology (Honours)
Major: Biotechnology and Biochemical Engineering
Minor: Mathematics and Computing
GPA: 8.6/10 (first in class)

Research Interests

Structural Bioinformatics, Molecular Dynamics, Statistical Modelling, Genomic Data Analysis, High Performance Scientific Computing, GPU programming, Linux System Programming

Research Experience

2018–2019 **Identification of Human Host Factors for *Flaviviruses*.**
Senior Thesis (BTP) at Indian Institute of Technology, *Kharagpur, India*
Supervisor: Prof. Riddhiman Dhar

- Analyzed genome wide screen data to identify proviral and antiviral host factors.
- Utilized non-parametric test (Mann-Whitney U test) with multiple testing correction.
- Determined relevant interaction pathways through gene ontology based networks.

Summer 2018 **Fragment Based Modelling of ssRNA - Protein complexes.**
Summer Internship at Inria Nancy (University of Lorraine), *Nancy, France*
Supervisor: Dr. Isaure Chauvot de Beauchene

- Extended the fragment based ATTRACT algorithm for ssRNA secondary structures.
- Achieved RMSD within 2 to 6 Å against known complexes: 4pkd, 2c4z, 1ec6, 5udz.
- Optimized the time complexity by parallelizing using numpy to enable scaling up.

2017–2018 **Rigid Body Modelling of Protein - DNA Interactions.**
Research Project at Indian Institute of Technology, *Kharagpur, India*
Supervisor: Prof. Agneyo Ganguly, Prof. Pralay Mitra

- Created a new docker using method of convolutions (Katchalski-Katzir algorithm).
- Modelled 3-dimensional DNA strands of varying parameters using 3DNA.
- Successful against the Haddock benchmark for easy and intermediate cases.

Skills

Languages	C, C++, Python, Bash, R, MATLAB, Ruby, Javascript, Java, Perl, PHP, LaTeX
APIs	Scipy, Numpy, Pandss, CUDA, OpenCV, TensorFlow, OpenGL, NodeJS
Tools	VMD, CHARMMM, PyMOL, Visual Studio, Vim, Git, Gimp
OS	Windows, Linux (Debian, Archlinux), Unix (xv6)

Development Work / Projects

2019–present **BioCPP**, *a minimalist C++ library for Computational Structural Biology.*
An open-source project I am working on, currently hosted at github.

- Compatible with different structure file formats
- Implements standard required data structures and commonly used algorithms.
- Easily programmable pipeline.

2018–present **coala**, *an open-source project on Github.*
Member of the coala organization and open-source community, hosted on github.

- open-source language independent analysis toolkit, written in Python.
- worked on several aspects: the central code base, PR review and documentation.

2018–present **Game Development**.
Member of the indie game development community. .

- Participate regularly in Game Dev Competitions (i.e. Ludum Dare).
- Well versed in Graphic Programming Tools: OpenGL API, Blender, LWJGL.

Awards & Achievements

- Recipient of the Institute Silver Medal, IIT Kharagpur.
- Secured the 1st rank within the B.Tech. graduating batch of 2019, at the Department of Biotechnology, IIT Kharagpur.
- Invited to participate in the National Science Camp (Vijyoshi) held by the Indian Institute of Science, Bangalore in 2014.
- Informatics Olympiad: National level finalist in the Indian National Olympiad of Informatics (INOI) held by IARCS in 2014 and 2015. (Selection camp for Indian team to International Olympiad of Informatics)
- Second Runners Up in HP Code Wars - India held in Bangalore in 2014, with participation from over 55 finalists from across the country.

Scholarships & Fellowships

- Kishore Vaigyanik Protsahan Yojana (KVPY) scholarship, by the Indian Institute of Science Bangalore in 2014.
- National Talent Search Examination (NTSE) scholarship, by the National Council of Educational Research and Training (NCERT) in 2013.
- State Level NTS scholarship, by the Department of State Educational Research and Training Karnataka (DSERT) in 2011.

Positions of Responsibility

- Governor: Debating Society, IIT Kharagpur
- Literary Secretary: Homi J. Bhabha Hall of Residence, IIT Kharagpur

Volunteer Services

- Member of the First Bengal EME Coy, National Cadet Corps (2015-2016).
- Content Creation for NPTEL course on Effective Speaking, Indian Ministry of Human Resource Development (2017).