# Ruhila S.

*Hostel 7*
*IISER Mohali, 140306,*
*ms20110@iisermohali.ac.in*
*RuhilaS*
*https://github.com/RuhilaS/*

*"Nothing exists for itself alone, but only in relation to other forms of life."*
*– Charles Darwin*

## Personal Data

| | |
|---|---|
| Name | Ruhila S. |
| Date Of Birth | 20.09.2001 |
| Birthplace | Virudhunagar, Tamil Nadu, India |

## Education

2021–PRESENT **B.S-M.S. Biology (Major) Data Science (Minor)**, *Indian Institute of Science Education and Research (IISER)*, Mohali, *India*
8.3 CGPA

2020 **Intermediate (AISSCE)**, *Velammal Vidyalaya, Ayanabakkam*, Chennai, *India*
83.8% Central Board of Secondary Education (CBSE)

2017 **High School (AISSE)**, *Velammal Vidyalaya, Ayanabakkam*, Chennai, *India*
10.0 Cumulative Grade Point Average (CGPA) in Central Board of Secondary Education (CBSE)

## Experience

### Internships

WINTER 2022 **Dr. Nagma Parveen**, *IIT Kanpur*, Research Intern
I familiarized myself with wet-lab methods for studying the mechanisms of viral action under varying external stimuli. I also began work on a protocol for the generation of pseudoviruses for SARS-CoV-2 based on an HIV-1 lentiviral packaging system with a luciferase reporter.

Summer 2022–present **Prof. Arnar Pálsson**, *University of Iceland*, Research Staff

Detailed analysis in a literate and reproducible manner for simulating a series of possible molecular evolutionary pathways for the *Salmolid* using phylogenetic trees. This involved the five steps on an HPC (High Performance Computer) with literate programming visualization in R:

- Data curation with NCBI databases
- Homology inference using similarity measures (BLAST)
- Multiple sequence alignment (MUSCLE5)
- Alignment trimming (G-BLOCK)
- Tree simulation with distance measures (BIONJ) and maximum likelihood approaches (RAXML-NG)

Project Report: Computational Primitives for Evolutionary Paths (≈ 147 pages)

Summer 2021 **Dr. Lolitika Mandal**, *IISER Mohali*, Research Intern

Exploring Genetic Tools for working with Drosophila from a wet-lab perspective of data collection and analysis.

### Volunteer Work

2022–present **IEEE P3173**, *IEEE Standards Committee*, Secretary

Am supporting the drafting the IEEE Standard for Endocrine Disrupting Chemical Hazard Labeling

2021–present **Biological Society**, *IISER Mohali*, Member

Enthusiastic participant and also am responsible for arranging independent peer-reviewed article readings.

2021–present **Dance Society**, *IISER Mohali*, Member

Active participant for choreography and performances.

## Certifications

### NPTEL Courses

Sep 2022 **Applications of machine learning techniques in biology using WEKA**, *IIT Madras*, Distinction, 93%

### Other Courses

Nov 2022 **Practical Python for beginners: a biochemist's guide**, *Biochemical Society, U.K.*

Nov 2022 **The future of HPC programming - a Modern Fortran workshop**, *Swedish National Infrastructure for Computing, Online*

## Technical Skills

### Programming Languages

Experienced R, Python (3.x), Shell (zsh,bash)

Familiar C, Java

### Bioinformatics Packages

Experienced Randomized Axelerated Maximum Likelihood new generation (RAXML-NG), MUSCLE5 (multiple sequence alignment)

Familiar WEKA, BEAST2 (Bayesian Evolutionary Analysis Sampling Trees) via babette, Snakemake

### Tools

| | |
|---|---|
| Experienced | Git (version control), ssh, Vim, Markdown |
| Familiar | Office-Suites (MS, OpenOffice, LibreOffice) |

### Experimental

| | |
|---|---|
| Biological | Handling flies (wild-type, w118, tubby), Drosophila larva dissection (brain, salivary gland, proventriculus, imaginal discs, gastric caeca), Fixing, staining, mounting viewing tissues with Flourescent microscopes, Making PBS, PFA |
| Professional | Time management, critical thinking, problem solving, communication |

## Research Topics

| | |
|---|---|
| Experienced | Phylogenetic Tree Construction (Distance, Maximum Likelihood, Bayesian), Evolutionary Biology, Population genetics, R reproducible literate programming, High performance open source software, Scientific Software Development for High Throughput calculations |
| Interested | Biomolecular simulations, Genomics, Modeling genetic markers for disease, Oncology and stem cells, Human genetics |

## Affiliations

### Memberships

2022–present **RSC (Royal Society of Chemistry)**, Student Member
2022–present **RSB (Royal Society of Biology)**, Student Member
2022–present **British Ecological Society**, Student Member
2022–present **Biochemical Society, UK**, Undergraduate Member
2022–present **Genetics Society, UK**, Undergraduate Member
2022–present **Genetics Society of America**, Undergraduate Member
2022–present **Royal Microscopical Society, UK**, Undergraduate Member
2022–present **IEEE EMBS (Engineering in Medicine and Biology Society)**, Student Member
2022–present **Federation of European Biochemical Societies (FEBS)**, Member
2022–present **European Microscopy Society**, Member
2022–present **ACM (Association for Computing Machinery)**, Student Member

## Publications

### Conference Proceedings

Rohit Goswami, Ruhila S , Amrita Goswami, Sonaly Goswami, and Debabrata Goswami. "Reproducible High Performance Computing Without Redundancy with Nix (accepted)." In: *2022 Seventh International Conference on Parallel, Distributed and Grid Computing (PDGC)*. 2023.

Rohit Goswami and Ruhila S . "High Throughput Reproducible Literate Phylogenetic Analysis (accepted)." In: *2022 Seventh International Conference on Parallel, Distributed and Grid Computing (PDGC)*. 2023.

### Preprints

Rohit Goswami, Ruhila S , Amrita Goswami, Sonaly Goswami, and Debabrata Goswami. *Unified Software Design Patterns for Simulated Annealing*. Feb. 6, 2023. arXiv: 2302.02811 [physics]. URL: http://arxiv.org/abs/2302.02811 (visited on 02/10/2023).

## Conference Records

### Posters

November 2022 **Tracing Lineages of *Salmo Salar* through Histone sequence data**, *BES Annual Meeting 2022*, Ruhila S.

### Oral Presentations

November 2022 **High Throughput Reproducible Literate Phylogenetic Analysis**, *IEEE PDGC-2022*, R. Goswami, Ruhila S.

November 2022 **Reproducible High Performance Computing Without Redundancy with Nix**, *IEEE PDGC-2022*, R. Goswami, Ruhila S., A. Goswami, S. Goswami and D. Goswami

November 2022 **Reproducible Literate Programming Workflows for Censored Data**, *IOP Machine Learning for Healthcare*, R. Goswami, R. S.