Pranav Ballaney

March 24, 2022

Lucknow, India
ballaneypranav@gmail.com | f20180635@goa.bits-pilani.ac.in
+91-9044849046
linkedin.com/in/ballaneypranav | github.com/ballaneypranav

Education

Birla Institute of Technology and Science, Pilani — Goa, India
Master of Science in Biological Sciences — *Aug. 2018 – May 2023 (expected)*
Bachelor of Engineering in Computer Science and Engineering
Cumulative GPA: 9.25/10

Delhi Public School, Indira Nagar — Lucknow, India
All India Senior Secondary Certificate Examination — *Graduated May 2017*
Percentage in Class 12: 89.4%
CGPA in Class 10: 10/10

Work Experience

National Resource for Network Biology — May 2021 – August 2021
Student Developer under Google Summer of Code 2021 at Keio University, Japan — *(Link to Project)*
Developed a simulator for SBML models, along with parsers for SBML and MathML in Rust, under the guidance of Dr Akira Funahashi, Department of Biosciences and Informatics. The simulator applies the Runge-Kutta and Runge-Kutta-Fehlberg methods for numerical integration of ODEs in an SBML model.

Debian — May 2020 – August 2020
Student Developer under Google Summer of Code 2020 — *(Link to Project)*

- Worked on quality assurance and continuous integration of applications in life sciences and medicine.
- Designed test suites for over 40 applications in bioinformatics, performed bug fixes and added several new packages to the Debian operating system.

Publications

Mishra, B., Ballaney, P., Saha, G., Shinde, A., Banerjee, S., Thimmakondu, V. S., & Aduri, R. (2022).
An *in-silico* discovery of potential 3CL protease inhibitors of SARS-CoV-2 based upon inactivation of the cysteine 145-Histidine 41 catalytic dyad.
Journal of Biomolecular Structure and Dynamics, 1–20. https://doi.org/10.1080/07391102.2022.2047108

Research Experience

CSIR - Institute of Genomics and Integrative Biology — February 2021 - July 2021
Carried out molecular dynamics simulations of autophagic complexes to understand the process of formation of autophagosomes under the guidance of Dr. Lipi Thukral, Senior Scientist at the Computational Structural Biology lab.

RNA Secondary Structure Prediction — January 2021 - Present
Currently working on evaluation and extension of computational tools used to predict RNA secondary structures, under the guidance of Dr. Raviprasad Aduri, Assistant Professor, BITS Goa.

iGEM Competition 2020, BITS Goa — November 2019 – November 2020
Software Team Lead — *(Link to Project)*

- Awarded the **Gold Medal** along with two Special Prizes for Best Software Tool and Best Composite Part
- Worked under the supervision of Dr. Sumit Biswas, as part of the first iGEM team from BITS Goa, on reduction of post-harvest losses in sugarcane, by using genetically engineered bacterial systems.

CSIR - Institute of Genomics and Integrative Biology — May 2020 – June 2020
Research Intern

- Worked under the guidance of Dr. Lipi Thukral, to quantify interactions between the SARS CoV2 spike glycoprotein and the human ACE2 receptor.
- Built visualizations using comparative force-directed graphs to understand these interactions.

Projects

iGEM WikiSync and the iGEM Wiki Starter Pack | *Python, Node.js* — June 2020 – Present
Developed software to help iGEM teams build their wikis. Adopted by several iGEM teams throughout the competition season and awarded the **Best Software Tool** Special Prize at iGEM 2020. — *iGEM WikiSync*, *iGEM Wiki Starter Pack*

Technical Skills

Languages: Python, C, C++, Java, Rust, HTML, CSS, JavaScript, Bash
Frameworks: Flask, Django, jQuery, NumPy, Pandas, Scikit-Learn, ProDy
Bioinformatics: Molecular dynamics simulations, protein modelling, docking and secondary structure prediction

Relevant Courses

Biology: Biochemistry, Microbiology, Cell and Molecular Biology, Bioinformatics, Genetics, Recombinant DNA Technology, Immunology, Biophysics, Developmental Biology, Biomolecular Modelling

Mathematics: Mathematics I (Multi-variable and Vector Calculus), Mathematics II (Linear Algebra and Complex Analysis), Mathematics III (Differential Equations), Probability and Statistics, Nonlinear Dynamics and Chaos

Computer Science: Object Oriented Programming, Data Structures and Algorithms, Database Management Systems, Operating Systems, Computer Architecture, Deep Learning, Compiler Construction, Design and Analysis of Algorithms, Computer Networks, Quantum Information and Computing

Other Experience

- **Teaching Assistant for Computer Programming and Digital Design:** Responsibilities include conducting labs for students.
- **Student Mentor under the Academic Assistance Program for General Biology:** Responsibilities included conducting extra tutorials for first-year students.
- **Peer Mentor as a part of the Peer Mentorship Program:** Helping students navigate through college and looking after their academic and personal interests.