

Derrin Bright

Bioinformatics | Biotechnology

+91 95666 35920 derrinbright@gmail.com GitHub LinkedIn

Personal Statement

A versatile and driven individual with a strong passion for utilizing computational technologies to decode complex biological systems. With a solid foundation in drug discovery, molecular modeling, and machine learning, I specialize in bridging the gap between biology and data science to drive transformative research.

Education

Vellore Institute of Technology (VIT) <i>Bachelor of Technology in Biotechnology</i>	CGPA: 8.76 Vellore, India 2022-Present
Chettinad Vidyashram <i>CBSE Biology-Mathematics</i>	10th- 91%; 12th- 94.8% Chennai, India 2008-2021

Technical Experiences

Ashoka University <i>Research Intern</i>	Delhi, India Jan 2024 - Present
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- Developing an IoT-enabled UTI diagnostic device for rapid and accessible analysis in rural areas.
- Leveraging AI/ML technologies to detect multiple asymptomatic diseases, enhancing diagnostic precision.
- **Supervisor:** Dr. Shraddha Karve

NovaLinks <i>BioTech and AI/ML Intern</i>	Vellore, India December 2024 - Present
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- Developing an IoT-enabled UTI diagnostic device for rapid and accessible analysis in rural areas.
- Leveraging AI/ML technologies to detect multiple asymptomatic diseases, enhancing diagnostic precision.

Teachnook <i>Data Science Intern</i>	Bangalore, India September - October 2024
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- Worked on multiple plant detection and defect detection tasks with the input image and plant specifications including the length and width of the sepals and petals.
- Implemented multiple algorithms including AdaBoost, Random Forest, SVM, and Logical Regressor to analyze the plant specifications and DenseNet and ResNet with multiple layers for analyzing the input images.
- Gained proficiency in Python, NumPy, and Pandas, alongside essential data visualization techniques, and foundational concepts on machine learning and deep learning.

Biversity <i>Bioinformatics Intern</i>	Vellore, India February 2024
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- Explored drug design and discovery with a focus on bioinformatics using cutting-edge computational tools.
- Utilized KNIME for molecular similarity searches, enabling chemical space exploration and compound prioritization.
- Conducted protein structure predictions using AlphaFold, building a foundation in structure-based drug design.
- Completed targeted projects, including antiviral and antibacterial drug screening and protein interaction prediction, enhancing my understanding of therapeutic targeting and molecular interactions in infectious diseases.

Alpha Bio Cell, VIT University <i>Vice Chairperson</i>	Vellore, India January 2024 - December 2024
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- Led several biotechnology and bioinformatics related events including hackathons, workshops, and quizzes, enhancing the club's engagement.
- Mentored junior core members, ensuring effective collaboration and event planning across different stages.
- Applied leadership, technical, and project management skills to drive various initiatives, significantly contributing to the club's growth and impact.

Technical Projects

RNA-Seq Analysis and Gene Interaction Modeling in Cervical Cancer and HPV Pathogenesis

- Conducting RNA-seq analysis on cervical cancer datasets to identify genetic similarities and potential causative factors of HPV infection.
- Visualizing complex biological data to extract meaningful insights into gene behavior and interactions.

3D Structure Prediction of Protein Complexes in Rabies Virus Infection

- Extracted protein sequence data from NCBI and predicted 3D structures using AlphaFold to study interactions between rabies virus glycoprotein (RABV-G) and nicotinic acetylcholine receptors (nAChRs).
- Analyzed predicted structures to understand critical interactions facilitating viral entry and infection, contributing to insights into rabies pathogenesis.

Screening Antimalarial Molecules Using 2D Fingerprint Similarity

- Screened a library of antimalarial molecules against a query (chloroquine drug) by generating molecular fingerprints and computing Tanimoto similarity coefficients using KNIME and RDKit nodes.
- Extracted molecular data from the Protein Data Bank (PDB) database and utilized RDKit to represent chemical structures as molecular fingerprints.
- Visualized pairwise similarity scores between molecular fingerprints as heatmap representation, identifying high-similarity molecules as potential candidates for antimalarial drug development.

Data-Driven Machine Failure Detection

October 2024

GitHub Link

- Developed an automated solution for machine failure prevention by analyzing key metrics such as operating temperature, proximity measurements, electrical current, and environmental factors like air quality and pressure.
- Employed a Random Forest model, achieving a 2.116% performance improvement over a baseline logistic regression model through feature engineering.

Asthma Risk Prediction Through Feature Selection and ML Optimization

GitHub Link

- Optimized asthma risk prediction by developing multiple machine learning models, including Random Forest, SVM, and Gradient Boosting, and finetuning hyperparameters using Grid Search Cross-Validation to maximize accuracy.
- Enhanced model accuracy and reduced data dimensionality by applying Recursive Feature Elimination (RFE) to identify the most predictive features.

Technical Skills

Computational Biology Tools	BLAST AlphaFold AutoDock GROMACS Chimera Bioconductor
Data Analysis Tools	Neo4J KNIME
Programming Tools	Python R Bash
Machine Learning Tools	TensorFlow Keras NumPy Pandas Matplotlib
Relevant Coursework	Bioinformatics Genomics and Proteomics Molecular Biology Cell Biology Genetic Engineering Biochemistry Immunology Biology Probability and Statistics Linear Algebra Calculus
Soft Skills	Problem-Solving Critical Thinking Leadership Management

Honors and Achievements

First runner-up in the Biomimicry Innovation Challenge and Showcase, Vellore Institue of Technology, 2024
Top 10 Winner of Bio-Inspired Design Fest (BIDFEST) Ideathon, Vellore Institue of Technology, 2024

Extra-Curricular

Volunteer | National Service Scheme, NGO

Conducted sessions in government schools on career opportunities and the importance of joining the armed forces.

Volunteer | Becoming I Foundation, NGO

Taught science, math, and English in government schools, supporting underprivileged communities.

Green Ambassador | Eco Club, Chettinad Vidyashram

Led tree plantations, recycling drives, and plastic waste collection, promoting sustainability and environmental awareness.

Event Coordinator | BioSummit, School of Biosciences and Technology

Organized a flagship event connecting academia and food industries, managing food distribution and ensuring smooth execution.

Event Coordinator | Yantra- Tech Fest, School of Biosciences and Technology

Organized a week-long technical fest with the collaboration of AlphaBioCell club of VIT Vellore.

Certificates

International Genomics and Bioinformatics Bootcamp , Genomac Institute Inc.	Certificate Link
Machine Learning A-Z , Udemy	Certificate Link
Python for Data Science, AI & Development , Coursera	Certificate Link
Bioinformatic; Bulk RNA-Seq Data Analysis , Coursera	Certificate Link
Advanced Bioinformatics , BioGrademy	Certificate Link