ARJUN JEEWAN

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India

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Statement

Aspiring PhD candidate with solid experience in AI and computational biology. Currently optimizing algorithms for gene-regulatory network inference, I seek to develop rigorous statistical methods for spatial omics and interpretable deep learning to drive reliable biomedical discovery.

Education

BITS Pilani, K.K. Birla Goa Campus — Oct 2020 – July 2024
B.E. in Computer Science; ***CGPA: 7.81/10.0*** — *Goa, India*

Delhi Public School, Navi Mumbai — July 2020
Class XII (CBSE); ***96.4%*** — *Navi Mumbai, India*

D.A.V. Public School, Nerul — July 2018
Class X (CBSE); ***97.2%*** — *Navi Mumbai, India*

Research Experience

Junior Research Fellow on-Project — July 2025 – Present
Advanced Centre for Treatment, Research and Education in Cancer - Tata Memorial Centre — *Navi Mumbai, India*

- Developing **FuSION** (github.com/supratik1/FuSION) , an open-source tool that integrates RNA-seq data with public pathway databases (KEGG) to assess functional significance in noisy gene-regulatory networks.
- Engineered the core C++ backend logic, refactoring constraint encoding for Microsoft Research's z3 SMT solver to achieve up to a **4x computational speed-up** in network analysis tasks.
- Benchmarking the tool against experimental microarray data to validate the robustness of the inference pipeline under varying noise levels.
- Co-developing the framework under the joint guidance of Dr. Supratik Chakraborty (IIT Bombay), Dr. Akshay S (IIT Bombay), and Dr. Prasanna V (ACTREC), bridging formal verification with cancer systems biology.
- Assisted with protein-protein docking (Schrodinger BioLuminate, Alphafold 3, Rosetta) and MD simulations (Desmond) to model the survivin protein's isoforms and wildtype-isoform heterodimers, contributing structural insights for targeted cancer therapeutic design.

Healthcare AI Research Intern — Sep 2024 – July 2025
IHub-Data, International Institute of Information Technology, Hyderabad — *Hyderabad, India*

- **Developed optimization techniques for an object detection pipeline** for abnormal cell detection in cervical cytology, utilizing domain-specific pre-processing and training optimization techniques to outperform state-of-the-art Average Precision by **4.8%** (Manuscript in preparation for submission to a top venue).
- Engineered ensemble frameworks (e.g., LightGBM stacking) over deep learning backbones (DenseNet, EfficientNet), improving model robustness and achieving **96% accuracy** on chest X-Ray classification tasks.
- Benchmarked standard architectures (ResNet, VGG) against real-world noisy medical data to establish rigorous baselines for disease localization.

Research Projects

Ensemble Deep Learning for COVID-19 and Pneumonia Detection in Chest X-Rays Sep 2024
IHub-Data, IIIT Hyderabad

- Developed a robust ensemble model integrating DenseNet, EfficientNet, and VGG features, achieving an accuracy of over 98% on chest X-ray classification tasks for COVID-19 and pneumonia detection.
- Optimized data pre-processing techniques using data augmentation strategies (rotation, zoom, and horizontal flips), leading to improved model generalizability on a dataset of over 6,000 X-ray images.
- Implemented visualization with Grad-CAM to enhance interpretability of model predictions for medical professionals, focusing on high-risk areas in X-ray images.
- Enhanced feature extraction by integrating LightGBM with ensemble deep learning models, resulting in improved classification performance and specificity, particularly in distinguishing subtle differences between COVID-19 and pneumonia manifestations.
- Performance-metrics management through balanced accuracy, sensitivity, and specificity calculations, achieving a precision of 97% and an F1 score of 0.94, with detailed confusion matrix analyses.

In-silico Drug Discovery for Type 2 Diabetes Jan 2023 – June 2023
BITS Pilani, Goa

- Screened small molecules targeting PPAR- γ transcription factor to increase insulin sensitivity, identifying potential drug candidates for Type 2 Diabetes treatment, in collaboration with Dr. Raviprasad Aduri.
- Conducted preliminary docking experiments using Autodock, and molecular dynamics simulations using GROMACS.
- Utilized Schrodinger Maestro's Glide for state-of-the-art docking improving docking scores by 25%, and validated stability via Desmond MD simulations, finalizing 3 promising candidates.

XGBoost for RNA-Protein Interaction Prediction Aug 2022 – Dec 2022
BITS Pilani, Goa

- Worked with Dr. Raviprasad Aduri and re-implemented the XRPI paper, a novel RNA-protein interaction (RPI) prediction model using XGBoost, a gradient boosting machine learning algorithm.
- Achieved state-of-the-art performance with 97.8% accuracy on NPInter and 99.4% accuracy on TeloPIN datasets, outperforming existing methods on diverse RPI types.
- Designed and implemented a data-driven feature engineering approach based on high-resolution structural data of RNA-protein complexes.
- Rigorously evaluated the model's performance using 10-fold nested cross-validation and external datasets, ensuring robustness and generalizability.

Computational Analysis of Cis-elements of Light Responsive Genes Jan 2023 – June 2023
BITS Pilani, Goa

- Assisted Dr. Rajesh Mehrotra and conducted a genome-wide analysis of AAAG repeat elements and AAAG-CTTT motifs in the *Arabidopsis thaliana* genome, identifying novel patterns of occurrence and distribution.
- Developed and implemented Python scripts to analyze large-scale genomic data, efficiently searching for motifs and calculating their frequencies across varying spacer lengths.
- Utilized statistical analysis and validated the significance of the overrepresented AAAGn7CTTT motif and provided evidence for its potential biological relevance in gene regulation.

Industry Experience

Software Development Engineer Intern Jan 2024 – June 2024
AltiusHub *Hyderabad, India*

- Developed and maintained responsive front-end features using React, MaterialUI, and TypeScript, achieving 95% cross-browser compatibility.
- Implemented comprehensive unit and integration tests, reducing production bugs by 40% and ensuring high code quality.

Summer Intern (AI/NLP) June 2023 – July 2023
New Street Technologies *Bangalore, India*

- Engineered a Rasa-based financial chat-bot for executives, enabling real-time retrieval of KPIs and disbursement statistics via natural language queries.
- Designed specialized NLP models trained on proprietary financial datasets to accurately interpret domain-specific terminology and extract trends.

Summer Intern (Open Source) June 2022 – July 2022
Swecha *Hyderabad, India*

- Led the front-end development for *Swecha Voice*, an open-source speech-to-text tool, integrating Mozilla's DeepSpeech API for real-time transcription.
- Implemented a crowd-sourced validation system for voice samples, improving model accuracy from 67% to 82% across Indian languages (Telugu, Hindi, English).

Skills

Programming Languages: Python, C++, TypeScript, JavaScript, MySQL
Bioinformatics: Proteomics (MALDI-TOF peak analysis), Schrodinger Maestro, Alphafold 3, Rosetta, GROMACS, Autodock
Technical Frameworks: PyTorch, TensorFlow, Keras, Postman API, LaTeX

Test Scores

Graduate Record Examinations (GRE), 2023 : 330/340
Test of English as a Foreign Language (TOEFL), 2023 : 112/120

Volunteering Experience

Co-Coordinator July 2022 – June 2023
BITS Goa Quiz Club

- Successfully organized and hosted the Waves Quiz Fest in BITS Goa's cultural fest Waves with 5 quizzes in November 2022
- Successfully organized Brainstorm '22, one of India's biggest online open Quiz-Fests with over 3000 registrants in August 2022

Mentor July 2022 – Dec 2022
Peer Mentorship Programme, BITS Goa

- Mentored 4 of my junior students and imparted valuable guidance in academic and extra-curricular endeavors.
- Provided tailored advice, helping them navigate challenges in coursework, time management, and skill-building.