

Rana Sheraz Ahmad

| ranasheraz.202101902@gcuf.edu.pk | [Github](#) | [LinkedIn](#) | [Website](#)

EDUCATION	Bachelor of Science in Bioinformatics <i>Government College University Faisalabad, Pakistan</i> CGPA till 6th semester: 3.12/4.0 Major Courses: Biological Data Analysis; Immuno-informatics; Proteomics; Genomics and Transcriptomics; Bioinformatics Software Development; Systems Biology; Bioinformatics Scripting; Artificial Intelligence; Modelling and Simulation.	Oct 2021 - July 2025
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RESEARCH INTERESTS	Health-Informatics; Computational & Comparative genomics; Disease Diagnosis; ML Assisted Bioinformatics Resource development.
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EXPERIENCE	Research Intern at Integrative Omics and Molecular Modeling Lab <i>Department of Bioinformatics and Biotechnology, GCUF, Pakistan</i>	June 2024 - Present
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RESEARCH PROJECTS	Developing Machine Learning Predictive Model to Accelerate Diagnosis of Heart Disease Risk <ul style="list-style-type: none">Developed a machine learning-based model to predict the risk of heart disease in patients, with a focus on practical implementation for early diagnosis.Integrated multiple machine learning algorithms, such as decision trees, random forest and Gradient Boosting, to predict heart disease risk across various patient demographicsOptimized model parameters to enhance prediction accuracy up to 97.7% and enabled clinicians to reliably monitor patient risk factors for informed decision-making
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	Multi-Class Brain Tumors Neurological Disorder Stratifying Algorithm <ul style="list-style-type: none">Employed a deep ensemble model using transfer learning technique to classify brain tumor types, including meningioma, pituitary, and glioma, from MRI images.Built a deep convolutional architecture by concatenating two pre-trained models which are VGG19 and Xception.The designed algorithm outperforms existing methods, providing reliable support for the early diagnosis of brain tumors type and offering valuable assistance to healthcare professionals in clinical decision-making.
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	Comprehensive Design and Evaluation of a Multi-Epitope Subunit Vaccine Targeting Respiratory Syncytial Virus (RSV) <ul style="list-style-type: none">Identified Fusion (F) and Nucleoprotein (N) from the Respiratory Syncytial Virus (RSV) as optimal candidates for multi-epitope vaccine development based on their immunogenic potential.Engineered T-cell and B-cell epitopes with minimal homology to human proteins to minimize immunogenic cross-reactivity and potential adverse effects.Constructed a 253-residue peptide construct incorporating a beta-defensin adjuvant to enhance immunogenicity, followed by structural validation through molecular docking and molecular dynamics simulations.The proposed epitope-based vaccine, designed using immunoinformatics approaches, shows promise as a therapeutic candidate to mitigate RSV infections and associated pathologies.
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Deep Learning-Based Diagnostic System for Citrus Plant Diseases

- Automated identification of citrus diseases in orchards using a convolutional neural network (CNN) deep learning approach.
- Designed a 7-layer deep CNN architecture to diagnose diseases in citrus plants such as **greening** (HLB), **canker**, **sunscaled**, and **leaf minor**.
- Deployed the algorithm on raw orchard images, achieving 98% accuracy in disease diagnosis.

TECHNICAL SKILLS

Bioinformatics databases: NCBI, EMBL, GenBank, UniProt, PDB, GEO-database, Cath, Scop, swiss-Prot, Ref-Seq, UCSC-Genome browser

Programming Languages: Python, C, C++, Java, Html/Css, MySql

ML & Python Libraries: TensorFlow, scikit learn, NumPy, OpenCV, Biopython, SciPy, Pandas, sys, Matplotlib, Plotly, Seaborn

Bioinformatics Tools:

- **Gene manipulation:** Blast, GenScan, Augustus, gProfile, PromH, GeneMark Interpro
- **Protein Manipulation:** PSI-Pred, InterProScan Blastp, Swiss-PdbViewer, I-Tasser, Prosite, Hmmer, Meme, Procheck, GrammX, Rosetta, Chimera
- **Alignment & Phylogenetic:** ClustalW, Mega, ClustalOmega, MUSCLE, MAFFT
- **Others:** Protparam, PSI-Blast, Emboss, Pssm, Plantcare, CpGProD, Vaxigen, AllerTop, IEDB, Ramage, PDB-Sum, FASTA, FASTAX, FASTAY, TBLASTx, TBLASTn, C-ImmmSim

Deep Learning Models: DNNs, RNNs, GANs, CNNs, Transformers

Global and Local Alignment-Tool on the basis of the Smith-Waterman and Needle-Wunsch Algorithm in Python.

Phylogenetic analysis of 20 organisms by using Mega and also their Bootstrap and footprinting analysis

HelixLink - A Startup website course project work by using HTML, CSS and Java-Script

Sentimental Analysis NLP task by using recurrent neural network.

WORKSHOPS & EXTRACURRICULAR ACTIVITIES

Workshop on Oxford-Nanopore Third Generation Sequencing

Department of Bioinformatics & Biotechnology, GCUF

04 October 2024

One-Day Symposium on Soil Health

Government College University Faisalabad

05 December 2023

Media Secretary - Head

Green Youth Movement, GCUF Chapter

05 August 2024 - Present

Amal Fellowship - 3-month Fellowship funded by Stanford University and PepsiCo

University of Agriculture Faisalabad

December 2024 - Present

LANGUAGE

English: ● ● ● ● ○

Urdu: ● ● ● ● ●

Punjabi: ● ● ● ● ●

REFERENCES

Can be provided on Request