ARCHANA NAGRAJ

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PROFESSIONAL SUMMARY

Passionate bioinformatics and neuroscience aspirant about exploring molecular and behavioral mechanisms of neurotransmitter and opioid receptor pathways. Interested in integrating computational biology, protein sequence analysis, ligand–receptor interaction prediction, and AI-based behavioral analysis to identify therapeutic targets for neurological and pain disorders. Eager to apply deep learning and bioinformatics approaches to study neurotransmission, NOP receptor function, and the modulation of pain pathways and including rat movement analysis .

EDUCATION

Bachelor of science in Bioinformatics
GPA:3.35
Reva University, Bengaluru, India (May 2024)

SKILLS

Bioinformatics Tools: BLAST, ClustalOmega, AutoDock Vina , AlphaFold, PyMOL, ChimeraX
Machine Learning / Deep Learning: DNA-BERT, CNNs, SVM , Transformers
Programming: Python (NumPy, Pandas, Matplotlib, Scikit-Learn, PyTorch, TensorFlow, Biopython), C , HTML , SQL, DBMS , Shell
Genomics & Proteomics: RNA-seq analysis, FASTA/FASTQ reading, protein structure modelling
Databases: UniProt, NCBI, PDB, KEGG, PubChem, Ensembl , AlphaFoldDB, UCSC Genome Browser , GEO, ClinVar, dbSNP, DrugBank, MGI

PROJECTS

1. Nutrient Deficiency Detection in Banana Plants using CNN

Objective : To develop an automated deep learning approach to support early detection of nutrient deficiency in crops for precision agriculture.

Tools and Libraries : Python, Tensorflow/ Keras , Layers, Sequential , Optimizers, Matplotlib, Google colab

Outcome: My model achieved around 60% accuracy. The learning curves show the CNN is learning but saturated due to dataset imbalance and limited features. To improve further , I plan to test DINOV2 to capture high-level leaf texture patterns.

2. Diabetes Prediction Using Logistic Regression

Objective : Built a predictive model to classify patients as diabetic or non-diabetic based on clinical features using logistic regression

Tools and Libraries : Python, Pandas, Numpy, Scikit-learn , Matplotlib, Seaborn

Outcome : My model achieved around 75% accuracy . To improve further in currently exploring advanced AI/deep learning techniques to improve prediction accuracy.

Certification

Bioinformatics algorithms and application

Research Interests

- Protein structure prediction and ligand-receptor docking

- Cancer and neurological disease research

- Neurotransmitter signalling and receptor binding

- Using advanced AI models such as DINOv3 and SAM to study rat movement for insights into stress and anxiety in neuroscience research.