

Sowmya Muthyala

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EDUCATION

Northeastern University, Boston, MA

Dec 2024

Master of Science in Bioinformatics

Related Courses: Bioinformatics Computational Methods, Statistics for Bioinformatics, Genomics in Bioinformatics, Machine Learning, Data Analysis, Intro to Data Science, Transcriptomics,

Sreenidhi Institute of Science and Technology, Hyderabad, INDIA

Aug 2020

Bachelor of Technology in Biotechnology

Related Courses: Genetic Engineering, Computational Genomics, Developmental Biology, Molecular Biology

WORK EXPERIENCE

Bioinformatics and Machine Learning - Institute for Experiential AI, Boston

Jun 2024 - Present

- Performed comprehensive analysis of **RNA-seq** data from antibody-activated T cells, leveraging advanced **R/Bioconductor** tools such as **DESeq2** and **Salmon** for differential gene expression, transcript quantification, and functional genomic insights, optimizing the accuracy of downstream biological interpretations and enhancing overall data robustness
- Streamlined RNA-seq pipelines by utilizing the **STAR aligner** and **rMATS** on Linux HPC clusters, processing over 500 transcriptomic samples with increased efficiency
- Constructed a graph neural network integrating **XGBoost** and clustering, using **SHAP** to enhance interpretability, analyzing mRNA splicing regulation by 200+ RBPs from multi-omics shRNA, eCLIP, and RNA-seq data

Quality Control Microbiologist - Revelations Biotech Pvt Ltd, India

Jan 2022 - May 2022

- Enhanced enzyme production through stringent quality control and process optimization, implementing documentation protocols to ensure efficiency and traceability.
- Programmed robotic systems to perform over 300 hourly tests, automating processes for consistent performance
- Analyzed 740+ weekly samples, improving fermentation efficiency by 4% while maintaining high-quality standards and batch traceability

Project Intern, Center for Biotechnology - JNTU, India

Jan 2020 - Apr 2020

- Performed phytochemical analysis to assess the nutritional quality of commercial fruit juices
- Examined 140 samples using **UV-Vis spectrophotometry**, achieving 94% accuracy in the analysis process
- Designed experimental protocols to evaluate six antioxidant compounds, enhancing the precision of nutritional assessments and advancing the institute's research outcomes

Summer Intern, Indian Institute of Technology, Hyderabad, India

Jun 2019 - Jul 2019

- Optimized recombinant protein production by **cloning** bacterial genes, focusing on increasing yield and efficiency in specialized projects
- Conducted 20+ rounds of protein expression and purification using **ion exchange**, **size exclusion**, and **affinity chromatography**, and processed bacterial culture and significantly boosting average purification yields across batches

ACADEMIC PROJECTS

Disease Prediction Using Machine Learning Models, Northeastern University

Dec 2023

- Designed multiple models with **Logistic Regression**, **SVM**, **Decision Trees**, **Random Forest**, and **Naïve Bayes**
- Executed various performance measures including a confusion matrix to select the best model
- Attained an accuracy of 73% with **SVM** and selected SVM for prediction

De novo transcriptome assembly and analysis of bacteria, Northeastern University

Dec 2023

- Improved the quality of **RNA-Seq** reads, achieved **de novo transcriptome assembly**, and pinpointed differentially expressed genes by developing a **robust pipeline**
- Conducted quality checks of RNA-Seq reads using **Fast QC**, assembled the transcriptome with the **Trinity** tool, and characterized proteins via **BLAST** searches against the Swiss prot database, enhancing the reliability and accuracy of gene expression analysis

SKILLS

Programming/Scripting Languages: Python (Packages: Biopython, Pytorch, NumPy, Pandas, Matplotlib), BASH, R Programming, Shell Scripting, Tableau

Bioinformatics tools: BLAST, FASTA, Bowtie2, Samtools, Trinity, DESeq, NGS (Next- Generation Sequencing)

Computer skills and proficiencies: Linux, Command line, GitHub

Core competencies: Project Management, Lab Operations, Technology Development