Rhea Charles

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EDUCATION

Master of Science in Public Health University of South Florida, Tampa, FL — August 2022 - Expected December 2024
Concentration: Genomics — **GPA:** 3.8/4.0

Bachelor of Dental Surgery Rajiv Gandhi University of Health Sciences, India — 2015 – 2020
GPA: 3.6/4.0

Overview of skills and experience:

- Research experience with various "multi-omics" data types (DNA-seq, RNA-seq, metabolomics, proteomics).
- Utilized tools like FastQC, HISAT, Cufflinks, Cuffdiff, DEseq and HPC clusters for research and development.
- Worked with SAM and BAM file formats for RNA -Seq and Next Generation Sequencing (NGS) data analysis.
- Performed statistical learning methods: Machine Learning techniques (linear and non-linear regression analysis, K-Nearest Neighbors).
- Proficiency in Mendelian Randomization analysis and reproducible workflows.
- Genomic data analysis and visualization using scripting languages like R, Python/Perl and Bash in Unix/Linux subsystems.

RELEVANT COURSEWORK

Projects:

1. Statistical analysis project using SPSS to investigate the relationship between BMI and income levels among children in the United States. Conducted chi-square tests and Pearson correlation analyses on the NHANES dataset. The analysis yielded results, which were compiled into a paper.
2. Replicated results in a multidisciplinary team, from research papers using a computational pipeline involving quality control, alignment, quantification, normalization, and DESeq2-based differential expression analysis, followed by R visualization with boxplots.
3. Presented a research proposal idea titled ‘Comparative Analysis of Gene Expression Profiles in PD-1-Treated Cytotoxic T Lymphocytes from Melanoma Patients: Implications for Immunotherapy’ which would use RNA Sequencing, Variant Calling, and Differential Gene Expression Analysis.
4. Built, tested and validated Machine learning models: Logistic Regression, Naïve Bayes, Lasso, Random Forest, and Boosting, to predict heart disease using RStudio. Feature selection involved correlation analysis and tree-based models. Models were trained and evaluated using cross-validation, with final selection based on accuracy metrics.

RESEARCH EXPERIENCE

Graduate Student, University of South Florida, Tampa, FL — Aug 2022 – Present

Mentor - Dr. Xiaoming Liu

- Independently conducted research for a Thesis titled 'Investigating the Influence of Multiple Exposures on Periodontitis via Mendelian Randomization' utilizing RStudio to identify potentially significant genetic variants.
- Scientific literature reviews to select instrumental variables.
- Gathered and analyzed GWAS data from repositories including Finngen, open GWAS, University of Bristol, Pan-UK Biobank, and the Social Science Genetic Association Consortium (SSGAC).
- Familiarity with bioinformatics tools to map rsids (SNPs) to coordinates of the Human Genome reference builds GRCh38 and GRCh37.
- Performed statistical analyses including MR regression analysis and leave-one-out analysis to ascertain causal inference for Mendelian randomization outcomes. Visualisation of results in RStudio.

Student Research Assistant, University of South Florida (Genomics Lab), Tampa, FL — May 2023 - Dec 2023

Mentor - Dr. Bi Zhao

Data cleaning and extraction:

- Compiled and parsed data from Uniprot and Disprot in formats like FASTA, FASTQ, JSON, TSV, CSV, and VCF using Python.
- Analyzed and filtered relevant data using packages like NumPy, pandas, ggplot2, dplyr, tidyr, caret, etc.

Machine Learning model for prediction of Disordered Proteins, Linkers, and Kinases:

- Used bioinformatics tools like BLAST, and CD-HIT for sequence similarity searches.
- Data partitioning in Python to evaluate the performance of the machine learning model.

WORK EXPERIENCE

Graduate Teaching Assistant, University of South Florida, Tampa, FL

Course: Introduction to Health Professions (HSC 2000) - Dr. Cooperman and Dr. Shabnam Mehra Aug 2023 – Present

- Evaluated student work, delivering constructive feedback and assessment. Delivered presentations on course topics like avoiding plagiarism to help promote understanding of course requirements. Technical support, troubleshooting, and one-on-one assistance were also provided.

Graduate Teaching Assistant, University of South Florida, Tampa, FL

Course: Modern Epidemiology using R (PHC 6934)/Modern Epidemiology (HSC 4933) - Dr. Edwin Michael Aug 23 – Dec 24

- Conducted In-person R practical sessions for undergraduate and graduate students, offering troubleshooting assistance and guidance for using RStudio to conduct epidemiology-related data analysis.
- Held in-person as well as virtual office hours once a week which aimed at enhancing the overall learning experience.
- Shaped course modules. Evaluated student work and provided constructive feedback.

Quality Systems Officer, New Mowasat Hospital, Kuwait Sep 2021 - July 2022

- Helped track and monitor data to identify patterns for risk assessment related to patient readmissions to find the root cause as well as to maintain a log of these issues.
- Process improvement strategies within the hospital by on-site monitoring to find root causes to maintain the quality of hospital standards.

Intern Dentist, SDM Dental Hospital, Karnataka, India Sep 2019 - Oct 2020

- Hands-on clinical experience, focusing on patient needs and therapeutic interventions.
- Performed research on bruxism and the challenges of diagnosis.
- Performed public health interventions for children and adults from poor socioeconomic backgrounds with a lack of access to oral healthcare which required interdisciplinary communication.

MEMBERSHIPS

- **Member**: Delta Omega Public Health Honorary Society March 2024 - Present