PAYSON JOHANSON

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Clark University, Worcester, MA **Expected: 2026**
B.A. Mathematics, Minor: Philosophy GPA: 3.79
Awards: Dean's List First Honors, Phi Sigma Tau (Philosophy Honors Society)

RESEARCH EXPERIENCE

Lab Member — Tabima Lab, Clark University **October 2025 – Present**
• Conduct computational phylogenetic and comparative genomics analyses of Basidiobolus species using high-performance computing (HPC) resources
• Use SLURM to submit and manage parallel bioinformatics workflows on the cluster, ensuring reproducibility and efficiency
• Develop Bash scripts automating pipelines integrating MAFFT, IQ-TREE, and BUSCO for genome completeness and evolutionary analysis
• Apply bioinformatics and computational biology techniques to assess genome assembly quality and phylogenetic relationships

PROFESSIONAL EXPERIENCE

Research Intern — Carnegie Mellon University / UnitedHealth Group June 2025 – July 2025
• Applied statistical and machine learning methods in R and Python to analyze healthcare datasets
• Conducted exploratory data analysis (EDA) and predictive modeling to identify health outcome patterns
• Collaborated with peers to present healthcare analytics findings to faculty and industry professionals

Laborer — Victory Millwork **May 2023 – July 2023**
• Maintained precision and attention to detail in production of custom millwork products
• Collaborated with team members to resolve production challenges and improve workflow efficiency

PROJECTS

County-Level Risk Analysis of Healthcare Access and Racial Disparities in Preventable Hospitalizations
• Investigated racial and socioeconomic disparities in preventable hospitalizations using county-level data from CHRR
• Performed exploratory data analysis (EDA), visualization, and race-stratified modeling to identify structural drivers of healthcare inequities

• Implemented Random Forest and Negative Binomial Regression models in R to evaluate effects of healthcare access and social determinants on hospitalization rates
• Found that education and unemployment were stronger predictors of preventable hospitalizations among POC-majority counties than provider supply alone
• Co-authored published report presented to faculty and healthcare analytics professionals

Comparative Phylogenetics & Phylogenomics of Basidiobolus
• Performed large-scale phylogenetic and phylogenomic analyses on 71 Basidiobolus genomes to investigate evolutionary relationships
• Generated Maximum Likelihood (ML) and Bayesian Inference trees using ITS and BUSCO gene datasets
• Conducted concatenated and coalescent phylogenomic inference to compare genome-scale versus single-gene evolutionary signals
• Developed Bash and SLURM scripts to automate BUSCO-based ortholog extraction and tree-building workflows
• Followed best practices for reproducibility, including organized directories, annotated scripts, and detailed lab notebooks

RELEVANT COURSEWORK

Linear Algebra • Probability and Statistics • Data Structures • Differential Equations • Genetics • Chemistry I & II • Real Analysis

SKILLS

• Technical: Python, R, Java, Bash (command-line scripting), SLURM (HPC), MAFFT, IQ-TREE, BUSCO
• Analytical: Bioinformatics, Data Cleaning, Statistical Modeling, Computational Biology, Predictive Analytics
• Interpersonal: Communication, Collaboration, Time Management, Critical Thinking