Jacob Alford

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Profile

Graduate student in Biotechnology (M.S., UTSA) with a focus in bioinformatics. Honors graduate in Microbiology and Immunology with research experience in bioinformatics and computational genomics. Developed GenomeProfiler (available on Bioconda), a Python pipeline for prokaryotic genomic feature detection. I am an open-source contributor to Bioconda and the Galaxy Project. I am seeking a bioinformatics internship to apply and expand my computational biology and bioinformatics skills, and I'm working toward a career in bioinformatics engineering.

Education

M.S. in Biotechnology (Expected 2027) Fall 2025 – Present
The University of Texas at San Antonio, San Antonio, TX

B.S. in Microbiology and Immunology Fall 2022 – Spring 2025
The University of Texas at San Antonio, San Antonio, TX

- Graduated *Cum Laude*, Honors Graduate with Distinction

Research Experience

Student Researcher, Bioinformatics and Computational Genomics Fall 2023 – Present
Dr. Mark Eppinger's Lab, UTSA, San Antonio, TX

- Developed an automation pipeline (GenomeProfiler) in Python for the detection of a variety of prokaryotic nucleotide sequence features. Designed the pipeline to automate data collection and processing for downstream visualization and further analysis, improving lab-wide efficiency in handling of genomic datasets.
- Gained experience in computational genomics, reproducible bioinformatics workflows, and collaborative research in a lab environment.
- Participated in research conferences and gained experience in scientific communication.
- Learned and worked with a variety of bioinformatics tools and pieces of software to complete lab duties.

Technical Skills

UNIX Command Line (Linux and Mac OS X) ■■■■
Computational Genomics ■■■■
Genome Analysis ■■■■
HPCC / Slurm Workload Management ■■■□
Conda use and Bioconda Packaging ■■■□
Galaxy platform use and local Galaxy server management ■■■□
Sequence Alignment / Comparison (BLAST, Diamond, Mash) ■■■□
Package Management ■■■□
Visualization tools ■■■□
Git/GitHub ■■■□
Python ■■□□
Open-Source Development ■■□□
Bash ■■□□
Genome assembly (Flye) ■■□□
Genome Annotation ■■□□

Conference Presentations

- Jacob Alford *et al.* Genome and Antibiotic Resistance Profiles of the Multidrug-Resistant Shiga Toxin-Producing *Escherichia coli* O111:H8 Strain UTAK-22. Poster presented at the Genomic Research and Data Center for Computation and Cloud Computing (GRADS-4C) Second Annual Symposium, North Carolina A&T State University, Greensboro, NC (2025). **Recipient of GRADS-4C Travel Award**.
- Jacob Alford *et al.* Resistance Profile of a Multidrug-Resistant Shiga Toxin-Producing *Escherichia coli* (MDR-STEC). Poster presented at the UTSA MMI Spring Symposium, The University of Texas at San Antonio, San Antonio, TX (2025).
- Jacob Alford *et al.* Multi-drug-resistant plasmid pUTAK-22-1 of Shiga Toxin-Producing *Escherichia coli* serotype O111:H8. Poster presented at ASM Texas Branch Spring Conference, Cedar Hill, TX (2025). **Awarded Orville Wyss Award (3rd Place, Antimicrobial Microbiology)**.

Publications

Acknowledged in: Phylogenomic framework and virulence gene boundaries of emerging Shiga toxin-producing *Escherichia coli* O118 informed by the comprehensive profiling of 359 O118 genomes
Irvin Rivera, Sara S.K. Konig, Armando L. Rodriguez, Joseph M. Bosilevac, Mark Eppinger
bioRxiv 2025.04.29.651274; doi: 10.1101/2025.04.29.651274

Certifications

- Python for Data Science (PY0101EN) - IBM SkillsBuild / Coursera (2025)

Awards & Honors

- Orville Wyss Award (3rd Place, Antimicrobial Microbiology), ASM Texas Branch Spring Conference, Cedar Hill, TX (2025)
- GRADS-4C Travel Award, Genomic Research and Data Center for Computation and Cloud Computing Symposium, North Carolina A&T State University, Greensboro, NC (2025)
- Honors Graduate with Distinction, The University of Texas at San Antonio (2025)
- Cum Laude, B.S. in Microbiology and Immunology, The University of Texas at San Antonio (2025)
- Eagle Scout, Boy Scouts of America (2020)

Leadership

STEM K–12 Outreach Officer Fall 2024 – Spring 2025
American Institute of Aeronautics and Astronautics (AIAA), UTSA Chapter, San Antonio, TX

- Coordinated STEM outreach events to local K–12 schools, promoting interest in science, technology, engineering, and mathematics.
- Organized and attended events representing the UTSA AIAA chapter to inspire students to pursue STEM disciplines.

Research Interests

Current research interests include computational genomics, bioinformatics, and the development of computational tools and pipelines to solve problems in bioscience fields. Currently independently designing and testing machine learning models to identify mobile genetic elements in prokaryotic nucleotide sequences independent of a database to develop a novel detection tool for mobile genetic elements.