Cameron Prybol

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Genomics, Bioinformatics, & Computational Biology

High-Throughput Genomics
7 years

Terabyte-scale genomics pipeline development and data processing

- Genome assembly, classification, quantification, and variant calling
- Transcriptome assembly and differential expression analysis
- Human, mouse, fungal, archaeal, bacterial, plant, viral, and microbiome datasets

Unix/Linux
9 years

Data acquisition, cleaning, parallel processing and pipeline automation

- Academic HPC clusters, AWS, GCP
- SLURM & Sun Grid Engine (SGE) job schedulers
- Managing, editing, and parsing of data using awk, sed, grep, parallel, and other GNU/POSIX tools
- Bash/Shell scripting for automated analysis pipelines
- Database management
- Managing File/Folder permissions

Python
7 years

Proficient with language usage and core data analytics/visualization libraries

- Rosalind bioinformatic challenges (http://rosalind.info/users/cameron.prybol/)
- Recruited by Google via foobar challenge
- Data analysis with pandas, scikit-learn, scipy, numpy
- Data visualization with matplotlib and plotly

Julia
3 years

Proficienct with language understanding/development and package development/maintenance

- Language of choice for developing custom bioinformatics software
- Contributor and developer of several core data analytics packages, including DataFrames.jl
- Prior member of JuliaData organization
- Data visualization with Plots.jl and custom visualizations with Luxor.jl
- Developing a probablistic graph-genome and kmer analysis package based on my thesis research

Web Development & Interactive Visualization
4 years

Database management and webpage design for discoverlife.org

- HTML, CSS, and Javascript (D3.js)(https://www.discoverlife.org/mp/20m?plot=3&la=33.9&lo=-83.3)
- Management of billions of species records and millions of photographs

Docker+Singularity Containers
2 years

Development of reproducible, containerized research pipelines and tutorials

- https://github.com/cjprybol/reproducibility-via-singularity
- Sochat VV, **Prybol CJ**, Kurtzer GM (2017) Enhancing reproducibility in scientific computing: Metrics and registry for Singularity containers. PLoS ONE 12(11)

Open Source Contributions
3 years

Data Science and Genomics (Please see GitHub profile for personal projects)

Projects Contributed To:

- JuliaLang/Julia
- JuliaData/DataFrames.jl
- JuliaGraphs/LightGraphs.jl
- sylabs/singularity
- Homebrew/homebrew-science
- JuliaStats/Distributions.jl
- JuliaStats/StatsBase.jl
- JuliaData/CSV.jl
- JuliaStats/DataArrays.jl
- JuliaStats/NullableArrays.jl
- JuliaData/CategoricalArrays.jl
- JuliaData/Missings.jl

Education

PhD *2015-2019* — Genetics, Stanford University, Stanford, CA

BS *2010-2014* — Biochemistry and Molecular Biology, University of Georgia, Athens, GA

- Cum Laude, Graduation with Honors

Research Experience

2016-2019 — Ashley/Synder Labs, Precision Medicine, Department of Genetics, Stanford University

- Probablistic Graph-based Approaches to Genome Assembly, Identification, Analysis, and Quantification

2015 — Li Lab, RNA-editing, Department of Genetics, Stanford University - *rotation*

- Quantitative trait loci analysis of RNA editing effects of genetic variants
- Differential gene expression in *in-vivo* protein knockdown samples

2015 — Montgomery Lab, Human Population Genetics, Department of Genetics, Stanford University - *rotation*

- Expression quantitative trait loci analysis during human bacterial infections

2014-2015 — Lewis lab, Chromatin Function and Regulation, Department of Microbiology, University of Georgia

- Heterochromatin regulation in knockout strain libraries and genetic crosses
- High-throughput genetic screens, DNA sequencing, and bioinformatic analysis

2012-2013 — Adams lab, BESC biofuels project, Department of Biochemistry, University of Georgia

- Media and growth condition optimization in hyperthermophilic biomass fermentations
- Reaction rates and enzyme kinetics of recombinant synthesis pathways

2012-2015 — Un estudio de Lepidoptera en el valle de San Luis (Costa Rica), independent research project

- Investigated phenology, voltinism, and abundance of tropical Lepidoptera
- Acquired funding, developed sampling protocols, trained and managed interns

2011-2015 — Pickering lab, Odum School of Ecology, University of Georgia

- Factors of Lepidopteran phenology, voltinism, and abundance across latitudes
- Developed species identification guides for academic/public use
- Managed databases and webpages in Unix (Sun Solaris) environment
- Identification of North, Central, and South American Lepidoptera

Publications

manuscript in prep — **Prybol, CJ**, Jiang, C, Snyder, M. Probablistic Graph-based Genome Assembly and Analysis with Metagenomic Applications.

2019 — Frésard, L. et al. Identification of rare-disease genes using blood transcriptome sequencing and large control cohorts. Nature Medicine 25, 911–919 (2019).

2019 — Zastrow, DB, et al. A toolkit for genetics providers in follow-up of patients with non-diagnostic exome sequencing. Journal of genetic counseling 28.2 (2019): 213-228.

2017 — Sochat VV, **Prybol CJ**, Kurtzer GM (2017) Enhancing reproducibility in scientific computing: Metrics and registry for Singularity containers. PLoS ONE 12(11)

2015 — Basenko, EY, Sasaki, T, Ji, L, **Prybol, CJ**, Burckhardt, RM, Schmitz, RJ, & Lewis, ZA (2015). Genome-wide redistribution of H3K27me3 is linked to genotoxic stress and defective growth. Proceedings of the National Academy of Sciences.

2014 — Basen, M, Rhaesa, AM, Kataeva, I, **Prybol, CJ**, Scott, IM, Poole, FL, & Adams, MWW (2014). Degradation of high loads of crystalline cellulose and of unpretreated plant biomass by the thermophilic bacterium Caldicellulosiruptor bescii. Bioresource Technology, 152, 384-392. http://doi.org/10.1016/j.biortech.2013.11.024

2014 — Basen, M, Schut, GJ, Nguyen, DM, Lipscomb, GL, Benn, RA, **Prybol, CJ**, et al. (2014). Single gene insertion drives bioalcohol production by a thermophilic archaeon. Proceedings of the National Academy of Sciences, 111(49), 17618-17623. http://doi.org/10.1073/pnas.1413789111

Posters, Presentations and Conferences

March 2019	JIMB/NIST Trainee Symposium
April 2016	NHGRI Career Development Symposium
April 2013	UGA CURO symposium
June 2012	Costa Rica Live
March 2012	UGA Discussion Circles

Scholarships, Grants, Awards, and Funding

2016-2019	Joint Initiative for Metrology in Biology
2015-2016	Stanford Genome Training Program
2015-2015	Stanford ADVANCE Summer Institute
2013	UGA Honors International Scholar Program
2012	UGA CURO Summer Fellowship
2010-2014	Hope Scholarship