

ZOE FORREST ELKINS

Ph.D. in Quantitative Genetics

@ zfelkins@proton.me

in linkedin.com/in/zforrestelkins

☎ 217-722-0366

📠 zfelkins.quarto.pub

✉ 8 Club Ct, Columbia MO 65201

🐙 github.com/zekaptain

EDUCATION

Ph.D. in Biological Sciences (Quantitative Genetics)

University of Missouri-Columbia

📅 Aug 2016 – Dec 2022

📍 Columbia, MO

Dissertation: The evolution and genetic basis of complex traits in *Drosophila melanogaster*

Advisor: Dr. Elizabeth G. King

B.S. in Computer Science & Psychology

Drake University

📅 Aug 2012 – May 2016

📍 Des Moines, IA

PROJECTS

Starvation resistance in an evolved multiparent population of the fruit fly (*Drosophila melanogaster*)

Project lead

📅 Aug 2019 – Present

- Designed an experiment and collected data at twelve-hour intervals every day for two months
- Managed and mentored an undergraduate student in data collection, management and analysis
- Spearheaded the statistical analysis of our survivorship data
- Wrote technical documentation for ease of replication
- Interpreted and communicated study results for scientific audiences
- Techs: RMarkdown, Tidyverse, Git, PowerPoint

Modeling statistical error due to coverage variation in pooled-sequencing DNA experiments

Project lead

📅 Dec 2022

- Identified opportunity to improve genomic analysis
- Simulated statistical error pipeline in a pooled-sequencing experimental framework due to variation in sequencing coverage
- Simulated data from random probability distributions
- Conducted an analysis of allele estimation across multiple sequencing coverages and calculated statistical error
- Wrote technical documentation for ease of replication
- Techs: Quarto Markdown, Tidyverse, reveal.js, LaTeX, Git

Exploration behavior in *D. melanogaster*

Project lead

📅 July 2018 – Dec 2022

- Collaboratively developed experimental design, analyses, and manuscript composition
- Cleaned and prepared genomic data for analysis
- Performed data management of large genomic datasets
- Conducted linear regression and randomization analyses on data
- Visualized data using ggplot2
- Techs: RMarkdown, Tidyverse, Bash scripting, GATK/BWA, SLURM, Git, Unix

SOFTSKILLS

Critical Thinking Problem Solving

Open-mindedness Team Work

Adaptability Professionalism

Work Under Pressure

Learning Potential

STRENGTHS

• Data Science

R Python Quarto Markdown

MATLAB JAVA SQL JavaScript

tidyverse NumPy Pandas

scikit-learn Jupyter notebooks Git

Unix/*nix Bash scripting

• Genomics

GATK BWA Picard Tools SnpEff

samtools PLINK R/qtl

• High-throughput computing

SLURM

• Development Tools – DB

SQL MongoDB PostgreSQL

• Development Tools – IDE & Text Editor

RStudio Vim Emacs Visual Studio

VS Code Node.js XCode

Microsoft Word

• Math/Statistics

Numerical linear algebra

Regression analyses Bayesian analyses

Monte Carlo methods

Artificial neural networks (ANN)

Survivorship analyses

Evolutionary algorithms

GRANTS

Life Sciences Fellowship

University of Missouri

📅 Aug 2016 – Aug 2020

📍 Columbia, MO

WORK EXPERIENCE

Science Writer

Columbia Daily Tribune

📅 June 2018 – June 2019

📍 Columbia, MO

- Contributed the weekly 'Ask a Scientist' column to the Columbia Daily Tribune
- Answered science questions from local gradeschool students

Undergraduate Research Fellow

Drake University

📅 June 2015 – Aug 2015

📍 Des Moines, IA

- DUSCI Summer Undergraduate Research Fellowship Program Fellow
- Conducted statistical analysis of behavioral data in the rhesus macaque
- Programmed a psychology video game experiment in Unity
- Techs: R, RStudio, Unity, C#

Marketing Intern

Health Alliance

📅 May 2014 – Aug 2014

📍 Champaign, IL

- Managed and updated client records on Salesforce
- Techs: Salesforce, Excel

Statistician Intern

Greene Galvanized Stairs

📅 May 2013 – Aug 2013

📍 East Lynn, IL

- Calculated statistical error in steel fabrication machinery
- Techs: Excel, SPSS

PRESENTATIONS

📄 Oral

The genetic basis and evolution of complex traits in *Drosophila melanogaster*

Dissertation Defense Seminar

📅 Dec 2022

📍 Columbia, MO

The genetic basis and evolution of complex traits in *Drosophila melanogaster*

Life Sciences Fellowship Seminar

📅 2021

📍 Columbia, MO

Escaping the warming climate: from penguins to fruit flies

Public lecture – Daniel Boone Regional Library

📅 2019

📍 Columbia, MO

The genetic basis of exploration tendency in *D. melanogaster*

Eco Lunch Seminar

📅 2018

📍 Columbia, MO

🖼️ Posters

Dietary impact on starvation resistance in an evolved multiparent population of *D. melanogaster*

Z. Elkins, J. Moaton, E. King – The Allied Genetics Conference

📅 2020

📍 Online

The genetic basis of exploration behavior in a multiparent population of *D. melanogaster*

Z. Elkins, A. Rahman, L. Storks, E. King – PEQG

📅 2018

📍 Madison, WI

📄 JOURNAL ARTICLES

Identifying splice sites of messenger RNA using Support Vector Machines

P. Diamond, Z. Elkins, K. Huff, L. Naylor, S. Schoeberle, S. White, T. Urness, M. Zwier
Midwest Instruction and Computing Symposium

Conference Proceedings

📅 2016

TEACHING/MENTORING

Genetics

Teaching Assistant

📅 Fall 2021 & 2022

📍 U. of Missouri

Taught on topics ranging across the field of genetics to 3rd- and 4th-year undergraduate students

Biology for Non-Majors

Teaching Assistant

📅 Fall 2020 & Spring 2022

📍 U. of Missouri

Taught in-person, hands-on laboratory coursework to undergraduate students. Students learned about the scientific method via lab experiments.

Undergraduate Research Mentor

Mentee: Jordyn Moaton

📅 2019 – 2021

📍 U. of Missouri

Topic: statistical analysis of fruit fly survivorship due to starvation

Evolution

Teaching Assistant

📅 Spring 2019

📍 U. of Missouri

Graded coursework and proctored exams for Dr. Elizabeth King's Evolution undergraduate course.

OUTREACH

Head Representative

Coalition of Graduate Workers

📅 2018 – 2020

- Led the Coalition of Graduate Workers' Representative Assembly, where I wrote and endorsed resolutions for the Representative Assembly's vote

President

Biology Graduate Student Association

📅 Jan 2018 – Dec 2019

- Advocated for biology graduate students' interests at the divisional level of the University of Missouri

Regional Coordinator

Out in STEM

📅 2016 – 2018

- Served as liaison between oSTEM chapters at universities in the Midwest and the global oSTEM organization
- Facilitated programming to make academic environments in STEM more inclusive for members of the LGBTQIA+ community