

Education

University of California, Davis Sept. 2019– Present
Plant Biology Graduate Group
Dissertation: “Using a combination of genomic prediction, genetic association, and crop modeling to study nutritional traits in maize and agronomic and quality traits in rice”
Advisor: Christine Diepenbrock

University of Oklahoma May 2019
Bachelor of Science: Plant Biology - Biotechnology

Research Experience

Department of Plant Sciences, University of California, Davis Sept. 2019– Present
PhD Candidate; Advisor: Christine Diepenbrock, PhD

- Analyzed maize genomic data for Joint Linkage and Genome Wide Association Study analysis
- Compared Genomic Prediction methods to predict carotenoid traits in a maize association mapping panel, including parallelizing and adapting scripts for High-Performance Computing

Department of Plant Biology and Microbiology, University of Oklahoma Mar. 2016– Aug. 2017
Undergraduate Research Assistant; Advisor: Laura Bartley, PhD Jan. 2018– May 2019

- Molecular techniques analyzing *OsAT5* gene expression on the cell walls of *A. thaliana*
- Switchgrass transcriptome analysis focusing on cell-wall related genes

Department of Molecular Plant Physiology, Utrecht University Sept. 2017– Dec. 2017
Undergraduate Research Intern; Advisor: Henriette Schluepmann, PhD

- Purified and quantified RNA from *Azolla filiculoides* differential gene expression analysis for application in domestication

Publications

MF LaPorte, M Vachey, M Fenn, C Diepenbrock, Simultaneous dissection of grain carotenoid levels and kernel color in biparental maize populations with yellow-to-orange grain, *G3 Genes|Genomes|Genetics*, 2022; <https://doi.org/10.1093/g3journal/jkac006>

R Dale, S Oswald, A Jalihal, **MF LaPorte**, DM Fletcher, AH Hubbard, SH Shiu, A Nelson, A Bucksch, Overcoming the challenges to enhancing experimental plant biology with computational modeling, *Frontiers in Plant Sciences*, 2021; <https://doi.org/10.3389/fpls.2021.687652>

Presentations

Zeavolution Maize Research Group [Virtual] Fall 2021
Corn Breeding Research Meeting [Virtual] Spring 2021
Colloquium: Plant Biology Graduate Group [Davis, California] Fall 2020
Poster: American Society of Plant Biologists Annual Meeting [Montreal, Quebec, Canada] Summer 2018

Honors and Awards

Department of Energy: Computational Science Graduate Fellowship Fall 2020 - Present
UC Davis Dean’s Distinguished Graduate Fellowship (Plant Biology) Fall 2019
Grand Prize Ronald Lehr Phi Beta Kappa Award for Undergraduate Research Spring 2018

Mary-Francis LaPorte
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Teaching and Mentoring

Software Carpentries

Fall 2019 - Present

Instruction of workshops for undergraduates, graduate students, faculty, and researchers in topics including: python, R, version control with Git, data management and organization, SQL database management

Undergraduate Mentoring

Winter 2022- Present

Mentored an undergraduate student (Computer Science major) to apply the mathematically-complex Reproducing Kernel Hilbert Space Model to predict carotenoid traits in maize. Covered topics including plant breeding, genetics and genomics, linear algebra, and code implementation and optimization

University Service

Mentorship Committee: Plant Biology Graduate Group

2021-2022

Developed and implemented resources for Graduate Students related to wellbeing and mental health during the pandemic and support for incoming graduate students

Plant Sciences Symposium Organizational Committee

2022

Worked towards accessibility, diversity, and inclusion for speakers and attendees at this industry-backed, student-organized conference

Advocacy committee: Plant Biology Graduate Group

2020-2021

Involvement in the UC Davis Graduate Student Association as a representative from Plant Biology

Relevant UC Davis Coursework

Statistical Methods for Research I & II (Statistics Department)

Individual data analysis projects in R, including the study of causal inference

Machine Learning (Statistics Department)

Mathematical theory and application of Python tools including sklearn and TensorFlow

Machine Learning (Computer Science Department)

Understanding and developing applications of machine learning models in python

Quantitative Genetics (Plant Science Department)

Applied quantitative genetics R packages (MASS, synbreed, etc) to animal and plant data

Advanced Plant Breeding (Plant Science Department)

Proposed a full hypothetical breeding program, from yearly optimization to IP

Programming Languages (Computer Science Department)

Studied the concepts behind lambda calculus, imperative programming, and language design

Programming Skills

R, Python, Shell Scripting, Version Control with Git, utilizing High Performance Computing