Mitchell J. Feldmann

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Research Interests

Quantitative & Population Genetics
Plant Breeding & Biology
Theoretical & Applied Statistics
Computer Vision & Machine Learning

Research Skills

Experimental design and statistical analysis
Genetic analyses including variance component estimation, genome-wide mapping and prediction
Familiarity with existing bioinformatics and genomics tools for variant calling and alignment
Programming and scripting using R, Unix, and Python
Running and managing jobs on a server or computing cluster
Experience managing field labor teams of up to 10 people and research assistants/interns
Handling/QC of NGS data (WGS, GBS, and RAD-seq)
Handling/QC of array-based genotyping data (Affymetrix SNP arrays)
Basic wet lab skills including DNA/RNA extraction, PCR, and library preparation

Education

University of California, Davis — Expected June 2020
Ph.D. in Horticulture and Agronomy
GPA: 3.76

University of Arizona — Aug 2012-May 2015
B.Sc. in Ecology and Evolutionary Biology
Minor in Mathematics
GPA: 3.73

Research Experience

Graduate Research Assistant — Sept 2015-Present
Strawberry Genetics
University of California, Davis
Advisor: Dr. Steven J. Knapp

Undergraduate Research Assistant — May 2014-Sept 2015
Plant-Herbivore Evolution
University of Arizona
Advisor: Dr. Noah K. Whiteman

Undergraduate Research Assistant — Aug 2012-Sept 2015
Arabidopsis Genetics
University of Arizona
Advisor: Dr. Frans E. Tax and Dr. Kenneth A. Feldmann

Teaching Assistant and Lecturer Experience

Guest Lecturer — June 6, 2018
"Breeding for fruit quality and disease resistance in strawberry"

Strawberry Field Day to Demonstrate Pest Management Research
University of California, Davis

Guest Lecturer Apr 4, 2018
"Plant architecture and bearing habit of Fragaria spp."
Fruit and Nut Cropping Systems (PLS 170B)
University of California, Davis

Guest Lecturer Jan 25, 2018
"On the estimation of variance components"
Quantitative Genetics and Selection Theory (PLS 290)
University of California, Davis

Guest Lecturer Nov 17, 2017
"Plant architecture and bearing habit of Fragaria spp."
Fruit and Nut Cropping Systems (PLS 170A)
University of California, Davis

Teaching Assistant Jan 2017-Apr 2017
Experimental Design and Analysis (PLS205)
University of California, Davis

Teaching Assistant Jan 2018-Apr 2018
Experimental Design and Analysis (PLS205)
University of California, Davis

Departmental and Professional Service

Admissions Committee Member of the Horticulture Grad Group Jan 2019-May 2019
University of California, Davis

Admissions Committee Member of the Horticulture Grad Group Jan 2018-May 2018
University of California, Davis

Admissions Committee Member of the Horticulture Grad Group Jan 2017-May 2017
University of California, Davis

Plant Sciences Seminar Leader Sept 2016-Sept 2018
Student Discussions in Plant Sciences (PLS290-008)
University of California, Davis

2017-2018 Elected Horticulture and Agronomy Graduate Group Officer Sept 2017-Sept 2018
University of California, Davis

2016-2017 Elected Horticulture and Agronomy Graduate Group Officer Sept 2016-Sept 2017
University of California, Davis

2018 UC Davis Plant Science Symposium Committee President Sept 2016-Apr 2017
University of California, Davis

2017 UC Davis Plant Science Symposium Committee Member Sept 2016-Apr 2017
University of California, Davis

Professional Development

Maricopa NSF Field-Based High Throughput Phenotyping Workshop Oct 2017
University of Arizona Maricopa Agricultural Center, Maricopa, AZ

RNA-seq Library Preparation and Data Analysis Workshop Feb 2017
UC Davis DNA Tech Core, Davis, CA

Genome Assembly and Analysis Workshop Dec 2016
UC Davis Bioinformatics Core, Davis, CA

Writing a Dissertation or Thesis Nov 2016
University Writing Program, Davis, CA

Tucson Winter Plant Breeding Institute Jan 2015

University of Arizona
Certificate Received

Publications

Tabb A, Medeiros H, Feldmann MJ, Santos TT. (2019) "Calibration of Asynchronous Camera Networks: CALICO." *Arxiv.* doi: https://arxiv.org/abs/1903.06811

Hardigan MA, Feldmann MJ, Lorant A, Famula RA, Acharya CB, Cole GS, Edger PP, Knapp SJ. (2019). "Genome synteny has been conserved among the octoploid progenitors of cultivated strawberry over million sof years of evolution." *Frontiers in Plant Science.* doi: https://doi.org/10.3389/fpls.2019.01789

Feldmann MJ, Hardigan MA, Famula RA, López CM, Tabb A, Cole GS, Knapp SJ. (2019). "Multi-dimensional machine learning approaches for fruit shape phenotyping in strawberry." *BioRxiv.* doi: https://doi.org/10.1101/736397

Gloss AD, Brachi B, **Feldmann MJ**, Groen SC, Bartoli C, Gouzy J, LaPlante ER, Meyer CG, Pyon HS, Rogan SC, Roux F, Bergelson J, Whiteman NK. (2017). "Genetic variants affecting plant size and chemical defenses jointly shape herbivory in Arabidopsis." *BioRxiv.* doi: https://doi.org/10.1101/156299

Articles in Prep

Feldmann MJ, Piepho HP, Bridges WC, Knapp SJ. "Overestimation of Genomic Heritability." *In prep.*

Feldmann MJ, Pincot DDA, Ledda M, Hardigan MA, Poorten TJ, Heffelfinger C, Cole GS, Acharya CB, Dellaporta S, Knapp SJ. "Genealogy spanning the 300-year history of garden strawberry." *In prep.*

Feldmann MJ, Tabb A, Knapp SJ. "Cost-effective, high-throughput 3-D reconstruction method for fruit phenotyping". *In prep.*

Data Releases

Feldmann MJ, Hardigan MA, Poorten TJ, Acharya CB, Colle M, Edger PP, VanBuren R, Knapp SJ. (2019). "Genotyping-By-Sequencing and Reference Genome Enabled Variant Discovery in Octoploid Strawberry [Data set]." Zenodo. http://doi.org/10.5281/zenodo.3576540

Feldmann MJ. (2019). "Classification and Quantification of Strawberry Fruit Shape [Data set]." Zenodo. *http://doi.org/10.5281/zenodo.3528385*

Tabb, A and Feldmann, MJ. (2019). Data and Code from: Calibration of Asynchronous Camera Networks: CALICO (Version 1.0) [Data set]. Zenodo. *http://doi.org/10.5281/zenodo.3520866*

Extended Abstracts

Feldmann MJ, Tabb A, Knapp SJ. (2019). "Cost-effective, high-throughput 3-D reconstruction method for fruit phenotyping." CVPPP 2019: workshop on Computer Vision Problems in Plant Phenotyping. Peer reviewed. IPPN.

Posters

Feldmann MJ, Hardigan MA, Lopez-Ramirez CM, Famula RA, Cole GS, Knapp SJ. (2020). "Genomic Prediction of Hybrid Performance in Strawberry." Plant and Animal Genome XXVIII. San Diego, CA.

Feldmann MJ, Hardigan MA, Lopez-Ramirez CM, Famula RA, Cole GS, Knapp SJ. (2019). "Heterosis and genome-scale diversity among high-yielding hybrids of strawberry." American Society of Horticultural Science. Las Vegas, NV.

Feldmann MJ, Tabb A, Knapp SJ. (2019). "Cost-effective, high-throughput 3-D reconstruction method for fruit phenotyping." Computer Vision and Pattern Recognition. Long Beach, CA. Poster.

Feldmann MJ. (2019). "Ordination, quantification, and quantization of strawberry fruit shape". UC Davis Plant Science Symposium. Davis, CA.

Feldmann MJ, Pincot DD, Poorten TJ, Heffelfinger C, Cole GS, Hardigan MA, Acharya CB, Dellaporta S, Knapp SJ. (2019). "Highly accurate forensic approaches for authenticating pedigrees and protecting intellectual property in octoploid strawberry using high-density SNP genotyping arrays." Gainesville, FL. North American Strawberry Growers Association.

Feldmann MJ and Knapp SJ. (2019). "Semi-unsupervised quantization of strawberry shape diversity in elite germplasm." Phenome. Tucson, AZ.

Feldmann MJ, Bhartia YV, Newell SA, Harshman JM, Knapp SJ. (2018). "Quantitative methods for studying fruit morphology in strawberry." Phenome. Tucson, AZ.

Feldmann MJ, Hardigan MA, Poorten TJ, Acharya CB, Colle M, Edger PP, VanBuren R, Knapp SJ. (2018). "Genotyping-by-sequencing and reference genome enabled variant discovery in octoploid strawberry." Plant and Animal Genome XXVI. San Diego, CA.

Feldmann MJ, Bridges WC, Knapp SJ. (2017). "Heritability of a quantitative trait locus." National Association of Plant Breeders Annual Meeting. Davis, CA.

Feldmann MJ, Gloss AD, Groen SC, Rogan S, Brachi B, Bergelson J, Whiteman NK. (2015). "Identification of genomic regions associated with adult herbivore preference and larval performance in *Arabidopsis thaliana."* University of Arizona EEB Undergraduate Conference. Tucson, AZ.

Presentations

Feldmann MJ. (2020). "Multi-Dimension Fruit Shape Phenotyping in Strawberry." Flavor, Nutrition, and Post-Harvest Genomics. Plant and Animal Genome XXVIII. San Diego, CA.

Feldmann MJ. (2020). "Genomic Prediction of Hybrid Performance in Strawberry." Strawberry Genomics. Plant and Animal Genome XXVIII. San Diego, CA.

Feldmann MJ. (2019). "Tractable Quantitative Genetic Approaches for High-Dimensional Phenotypes." University of Chicago, Chicago, IL.

Feldmann MJ. (2019). "Genetics and Breeding of Garden Strawberry (*Fragaria* × *ananassa*)." UC Davis SCOPE.

Feldmann MJ. (2019). "Ordination, quantification, and quantization of strawberry fruit shape." UC Davis Plant Science Symposium. Davis, CA.

Feldmann MJ and Knapp SJ. (2019). "Semi-unsupervised quantization of strawberry shape diversity in elite germplasm." Phenome. Tucson, AZ.

Feldmann MJ. (2018). "Forensic approaches for authenticating pedigrees and protecting intellectual property in breeding programs." Plant Breeding Annual Retreat. Monterey, CA.

Fellowships, Awards, and Features

2019 UC Davis Henry A. Jastro Graduate Research Fellowship ($3,000)
2019 UC Davis Horticulture & Agronomy Graduate Fellowship ($1,000)
2018 UC Davis Henry A. Jastro Graduate Research Fellowship ($3,000)
2018 UC Davis Horticulture & Agronomy Graduate Fellowship ($1,000)
2018 UC Davis January Plant Breeding Center Featured Student
2018 UC Davis Henry A. Jastro Graduate Research Fellowship ($2,580)
2017 UC Davis Horticulture & Agronomy Graduate Fellowship ($1,000)
2017 NSF Field-Based High Throughput Phenotyping Travel Award

Journals Reviewed

G3: Genes | Genomes | Genetics
Plant Phenome Journal
Plant Methods