RONGKUI HAN

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CORE QUALIFICATIONS

- Deep and clear understanding of frequentist and Bayesian statistical methodologies
- Proficiency in sequestering whole genome sequencing data for a large variety of analytical purposes
- Experience in processing drone-based high-throughput phenotyping data
- Strong ability to compile and deliver engaging scientific presentations

EDUCATION

SEPTEMBER 2016 — PRESENT
PHD CANDIDATE | PLANT BIOLOGY, UNIVERSITY OF CALIFORNIA, DAVIS

MAY 2020 — PRESENT
MASTER STUDENT | STATISTICS, UNIVERSITY OF CALIFORNIA, DAVIS
GPA: 3.89/4.00

Coursework, Biology: Advanced Plant biology, Advanced Genetic Analysis, Comparative Genomics, Genomics, Quantitative & Population Genetics, Statistical Genomics, Plant Morphology.

Coursework, Statistics: Analysis of Variance, Linear Regression, Probability Theory, Mathematical Statistics, Experimental Design & Analysis, Time Series Analysis, Multivariate Data Analysis, Computational Statistics, Machine Learning.

AUGUST 2011 — MAY 2015
BACHELOR OF SCIENCE | AGRICULTURAL SCIENCES, CORNELL UNIVERSITY
Summa Cum Laude

AWARDS & HONORS

- **2016 — 2021** National Science Foundation, *Graduate Research Fellow*
- 2015 Weed Science Society of America, *Undergraduate Research Award*
- 2014 ASA-CSSA-SSSA, *National Golden Opportunity Scholar*
- 2014 New York State Agribusiness Association Seed Committee, *Undergraduate Award*

RESEARCH

SEPTEMBER 2016 — PRESENT
PHD DISSERTATION PROJECTS, UC DAVIS | MICHELMORE LAB
Project I: QTL mapping of flowering time and photoperiod sensitivity in lettuce
- Obtained and processed Genotyping-by-Sequencing data and weekly developmental phenotype data for a lettuce Recombinant Inbred Lines (RIL) population
- Performed QTL mapping for the signature GxE trait using custom R scripts
- Discovered five independent major loci underlying variations in photoperiod sensitivity

Project II: High-throughput drone phenotyping and QTL mapping of lettuce floral opening time
- Collected hourly field drone images of a lettuce RIL population during flowering season

- Processed GPS-anchored raw images into field-level images using software Pix4D
- Accurately isolated floral pixels from field images using a machine learning algorithm
- Used Bayesian statistics to infer floral opening time from time-stamped flower pixel count data
- Discovered QTLs underlying variations in floral opening time

Project III: Phylogenetic footprint analysis of lettuce flowering time genes
- Identified interspecific orthologous gene groups using genomic animo acid sequences of seven eudicot species, including cultivated and wild lettuces
- Extracted promoter sequences of orthologous genes from respective reference assemblies
- Will perform promoter-region sequence conservation analysis to identify putative regulatory elements

Project IV: Bioinformatic prediction of transcription factor binding sites of lettuce reference genome
- Obtained Power Weight Matrices of experimentally validated core plant cis-regulatory motifs from database JASPAR 2018
- Annotated lettuce promoter sequences with regulatory motifs using software FIMO

JULY 2015 – JULY 2016
TECHNICIAN, CORNELL UNIVERSITY | SORRELLS LAB
- Built ridge regression models to predict protein, β-glucan and lipid contents in wheat and oat grains from infra-red spectrum data
- Managed germplasm records on T3 Wheat database

AUGUST 2013 – MAY 2015
UNDERGRADUATE RESEARCHER, CORNELL UNIVERSITY | MCCOUCH LAB
- Performed and visualized model-based population structure analysis on historical US rice varieties using Genotyping-by-Sequencing data and software PLINK, FastStructure and Distruct
- Developed genetic distance trees among US rice varieties using TASSEL and Geneious

PUBLICATIONS

Han, R., Wong, A. J. Y., Tang, Z., Truco M. J., Lavelle, D. O., Kozik A., Jin, Y., Michelmore R. Drone phenotyping and machine learning enable discovery of loci regulating daily floral opening in lettuce. In Review. doi:10.1101/2020.07.16.206953

Yu, C., Yan, C., Liu, Y., Liu, Y., Jia, Y., Lavelle, D., An, G., Zhang, W., Zhang, L., **Han, R.,** Larkin, R., Chen, J., Michelmore, R.W., Kuang, H. Upregulation of a KN1 homolog by transposon insertion promotes leafy head development in lettuce. In Review.

Macias-Gonzalez, M., Truco, M., **Han, R.,** Jenni S., Michelmore, R. W. High resolution genetic dissection of the major QTL for tipburn resistance in lettuce, Lactuca sativa. In Review.

Zhang, Y., Fletcher, K., **Han, R.,** Michelmore, R., & Yang, R. (2019). Genome-Wide Analysis of Cyclophilin Proteins in 21 Oomycetes. Pathogens, 9(1), 24. doi: 10.3390/pathogens9010024

Montilla-Bascón, G., Paul, A. R., **Han, R.,** & Sorrells, M. (2017). Quantification of betaglucans, lipid and protein contents in whole oat groats (Avena sativa L.) using near infrared reflectance spectroscopy. Journal of Near Infrared Spectroscopy, 25(3), 172-179. doi:10.1177/0967033517709615

Wang, D. R., **Han, R.,** Wolfrum, E. J., & McCouch, S. R. (2017). The buffering capacity of stems: Genetic architecture of nonstructural carbohydrates in cultivated Asian rice, Oryza sativa. New Phytologist, 215(2), 658-671. doi:10.1111/nph.14614

SKILLS

- R | Unix | Python | Perl
- English | Mandarin Chinese

MENTORING & TEACHING EXPERIENCE

RESEARCH SUPERVISOR | Michelmore Lab, UC DAVIS
- Boao Zhao: Undergraduate in Statistics at UC Davis.
- Fermin Zurissaday Banuelos-Gonzalez: Undergraduate in Biosystems Engineering at UC Davis.

TEACHING ASSISTANT
SEPTEMBER 2017 | Bioinformatics Core Facility RNA-Seq Workshop, UC DAVIS
- Assisted in setting up and teaching of using command line on a high-performance computing cluster to an audience of various level of background knowledge.
- Provided feedback to the instructors on progress and pace of the course.

SEPTEMBER 2014 – DECEMBER 2014 | CSS2110: Field Crop Systems, CORNELL UNIVERSITY
- Led weekly 4-hour field trips and/or lab sessions.
- Held weekly office hours to answer questions on course materials, homework and exams.

LEADERSHIP & SERVICES

PLANT BIOLOGY GRADUATE STUDENT ASSEMBLY | UC DAVIS
JUNE 2020 – PRESENT | Chair of the Mentoring Committee
- Helping incoming and first-year UC Davis Plant Biology Graduate students with their academic lives and mental health by arranging student and faculty mentors and supporting the mentorship with resources.
JUNE 2018 – JULY 2019 | Chair of the Recruitment Committee
- Worked closely with the program coordinator, faculty and staff, to successfully organize the 2019 three-day recruitment event for the UC Davis Plant Biology Graduate Group.
JUNE 2017 – JULY 2018 | Fundraising Chair
- Raised more than $3,000 in financial support from academic and industrial partners for the annual UC Davis Plant Biology Symposium

AGRICULTURAL SCIENCES MAJOR | CORNELL UNIVERSITY
FEBRUARY 2014 – MAY 2015 | Student Ambassador
- Supported prospective and current Agricultural Sciences students in finding and making use of the opportunities available at Cornell through hosting welcome events, consulting sessions, and in-class discussions

AGRICULTURE FUTURE OF AMERICA
FEBRUARY 2013 – DECEMBER 2013 | Campus Ambassador at Cornell University
- Developed leadership skills through intensive training programs and networking opportunities with industrial professionals
- Promoted of ongoing relationships between Cornell and AFA through delivering on-campus presentations, hosting agriculture themed events, and initiating communications with school faculty and staff

UNDERGRADUATE HORTICULTURE CLUB "HORTUS FORUM" | CORNELL UNIVERSITY
MAY 2014 – MAY 2015 | Treasurer
- Managed the income and expenditure of the club
- Enhanced prudent financial decision-making by fostering timely, open and critical discussions among club officers
MAY 2013 – MAY 2014 | Chair of Public Relations
- Promoted active communication between club members and officers, making sure the officers receive and respond to feedbacks from the members in a timely and open manner
Established the club's connection with different departments and organizations of the school
MAY 2012 – MAY 2013 | Greenhouse Manager
- Managed the club's 1000 ft2 commercial greenhouse of ornamental plants
- Organized plant sale events for fund-raising