J1, Ph.D.

Postdoctoral Associate, Plant Breeding, Genomics, and Phenomics

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========== Premise

Plant breeding quite literally sustained the development of human society and culture. I can't imagine a more delicious and intimate lens through which to explore the world.

========== Area of Interest

My interests focus on the application of *genomics*, *phenomics*, and *quantitative genetics* towards *breeding*. For my dissertation, I developed computer vision-based, high-throughput phenotyping tools for sweet corn ears and foliar fungal diseases. These phenotypes were leveraged against genomic data to explore population structure, trait genetic architecture, and genomic selection. This information helped inform breeding strategies in our sweet corn breeding program. I am implementing similar strategies in the context of turfgrass breeding at my current postdoctoral research position.

========== Education

Postdoctoral Associate, Turfgrass Breeding and Phenotyping

Rutgers University, New Brunswick NJ — **2023 –**

P.I.: Dr. Stacy Bonos

Ph.D. in Plant Molecular and Cellular Biology

University of Florida, Gainesville FL — **2017 – 2022**

Dissertation: *Phenomics and Quantitative Genetics of Sweet Corn Ear Architecture and Fungal Disease Resistance*

Bachelor of Arts in Biochemistry

New College of Florida, Sarasota FL — **2012 – 2016**

Senior Thesis: *Innate and Effector Plant Immunity Proteomics in Tomato*

========== Research Experience

Computer Vision Phenomics and Quantitative Genetics of Turfgrass

Postdoctoral Fellow, Dr. Bonos' Turfgrass Breeding Lab, Rutgers Univ. — **2023 –**

- **[Artificial Intelligence]** Data analysis in Bash, R, and Python, GIS
- **[Phenotyping]** Unmanned aerial vehicle phenotyping, logistics, analysis
- **[Bioinformatics]** Breeding population genotyping
- **[Quant. Gen.]** Genome wide association analysis, genomic selection, GxE

Computer Vision Phenomics and Quantitative Genetics of Sweet Corn Ear Architecture and Fungal Disease Resistance

Ph.D. Candidate, Dr. Resende's Sweet Corn Breeding and Genomics Lab, Univ. of Florida — **Fall 2017 – 2022**

- Command-line, big-data analysis in Bash, R, and Python
- Large field experiment organization, design, logistics, pollination, data collection, data analysis
- Whole genome sequencing and assembly
- Quantitative genetics, genome wide association analysis, genomic selection
- Fungal tissue culture, sterile technique
- Managerial experience in field work, tissue culture, genotyping
- Whole genome-sequencing and short/long-read assembly

Innate and Effector Plant Immunity Proteomics in Tomato

Undergraduate Research Assistant, Sixue Chen Lab, Univ. of Florida — **2014 – 2015**

- Wet-lab protein sample prep, mass spectroscopy training, -omics data analysis

Monitoring innate plant immunity with GUS reporter constructs in N. Benth.

Undergraduate Research Assistant, Greg Martin Lab, Boyce Thompson Institute, Cornell — **Summer 2015**

- Gene constructs, vector cloning, and plasmid prep

A Proteomics Analysis on Muscadine Grape Drought Stress

Undergraduate Research Assistant, Ramesh Lab, Florida Agricultural and Mechanical University — **Summer 2014**

- Wet-lab protein sample prep, -omics data analysis

========== Publications

J. M. Gonzalez, N. Ghosh, V. Colantonio, F. Pereira, R. A. Pinto Jr., C. Wasson, K. A. Leach, M. F. R. Resende Jr. (2021) EarCV: An Open-Source, Computer Vision Package for Maize Ear Phenotyping. *The Plant Phenome Journal.* Submitted. — **Published Mar. 2022**

J. Yu, J. M. Gonzalez, Z. Dong, Q. Shan, B. Tan, J. Koh, T. Zhang, N. Zhu, C. Dufresne, G. B. Martin and S. Chen (2021). Integrative Proteomic and Phosphoproteomic Analyses of Pattern- and Effector-Triggered Immunity in Tomato. *Frontiers in Plant Science Plant Proteomics and Protein Structural Biology*. Provisionally Accepted. — **Published Nov. 2021**

Y. Hu, V. Colantonio, B. S. F. Müller, K. Leach, A. Nanni, J. M. Gonzalez, B. Wang, M. Baseggio, L. Hislop, K. Swarts, M. A. Gore, T. A. Bierwagen, A. Myers, A. M. Settles, W. F. Tracy, and M. Resende (2020) Chromosome-scale genome assembly and population genomic analysis provide insights into the origin and evolution of modern sweet corn. *Nature Communications*. — **Published Feb. 2021**

W. Mussoline, J. M. Gonzalez, C. Christensen, M. Resende (2020) Harvest Yields for Sweet Corn Variety Trial in Northeast Florida. *Proc. Fla. State Hort. Soc.* — **Published Nov. 2020**

========== Extracurricular Experience

Assistant Lecturer, High-throughput Phenotyping for Genetic Gain — **2023**

Leading Professor: Dr. Stacy Bonos, Advanced Plant Breeding Class

Teaching Assistant, Applied Population Genetics Journal Colloquium — **2020**

Leading Professor: Dr. Marcio Resende. Facilitate paper discussions among graduate students and explain core concepts of applied population genetics.

Diversity Award Liaison, National Association of Plant Breeders — **2020 – 2021**

Organize the 2021 NAPB diversity award, connect mentors with mentees, advocate for diversity and inclusion in NAPB. Served as a mentee in 2019 and a mentor in 2020.

Diversity Award Liaison, Internet of Things for Agriculture (IoT4Ag), NSF Grant — **2020 – 2022**

Organize and asses inclusivity and diversity efforts at IoT4Ag.

President and former Vice-President, Univ. of Florida Minorities in Agriculture Natural and Related Sciences (MANRRS) — **2018 – 2021**

MANRRS *is a community* whose goal is to prepare and support minority students to become leaders, policy-makers, researchers in agriculture. As president, I have prioritized and organized a demand for *policy change* around *diversity equity and inclusion* of minorities at the college and departmental levels. I have also worked on organizing at the state level with the Florida Department of Agriculture and Consumer Services and MANRRS members from minority-serving institutions across the state.

Community Mentor, Univ. of Florida, MANRRS, Jr. MANRRS, NAPB, Language Exchange, Board of Education, Gainesville Science Fair, Community Gardening — **2017 – 2022**

I strongly believe in giving back to communities that supported me throughout my career. I have served as a mentee *and* mentor for various programs. I have mentored non-English speakers, primary and secondary school students, and undergraduates in the plant sciences, in plant breeding, in science fairs, in navigating graduate education, and in community gardening.

Field assistant manager, Sweet Corn Breeding and Genomics Lab, Univ. of Florida — **2017 – 2022**

Facilitated organizational logistics for field season. Team leadership, season planning, hiring and training staff, carrying out large phenotyping and pollinating efforts.

Treasurer and Industry Field-trip Coordinator, Univ. of Florida Plant Science Council — **2018 – 2019**

As treasurer, I secured and managed a yearly budget for workshops, professional development events, and outreach/volunteering events. As field-trip coordinator, I planned a two-day field-trip for ~20 students to Immokalee where we toured Sakata, Syngenta, and HM Clause agricultural research stations and learned about plant breeding in industry.

========== Presentations and Travel Awards

[Travel Award] ***Drones for High-throughput Phenotyping of Turfgrass.*** **J. Gonzalez, S. Bonos. AI in Agriculture and Natural Resources Conference – College Station, TX.**	**April 2024**
Drones for High-throughput Phenotyping of Turfgrass. **J. Gonzalez, S. Bonos. Turfgrass Symposium – New Brunswick, NJ.**	**March 2024**
[Travel Award] ***Dissecting Genetic Architecture of Leaf Blight Resistance with Computer Vision and Quantitative Genetics.*** **J. Gonzalez, K. Leach, M. Resende. Poster Presentation. Maize Genetics Conference – St. Louis, Missouri.**	**April 2022**
[1st Place Award] ***Sweet Corn Breeding with Computer Vision and Quantitative Genetics.*** **J. Gonzalez, K. Leach, M. Resende. Graduate Student Oral Presentation. Great Minds in STEM – Virtual Meeting.**	**Oct 2021**
[1st Place Award] ***Rapid Phenotyping of Sweet Corn with Computer Vision.*** **J. Gonzalez, K. Leach, M. Resende. Oral Presentation. International Sweet Corn Development Association – Virtual Meeting.**	**Dec 2020**
[1st Place & Travel Award] ***The Third Eye: Computer Vision for Sweet Corn Breeding.*** **J. Gonzalez, K. Leach, M. Resende. Graduate Student Oral Presentation. SACNAS Annual Conference 2020 – Virtual Meeting.**	**Oct 2020**
The Third Eye: Computer Vision for Sweet Corn Breeding. **J. Gonzalez, K. Leach, M. Resende. Guest Lecture. University of North Florida Biology Lecture Series – Virtual Meeting.**	**Sept 2020**
[2nd Place Award] ***Rapid Phenotyping of Sweetcorn Ears with Computer Vision to Aid Modern Breeding.*** **J. Gonzalez, K. Leach, M. Resende. Graduate Student Oral Presentation. National Association of Plant Breeders Annual Meeting – Virtual Meeting.**	**Aug 2020**
[1st Place Award] ***Rapid Phenotyping of Sweetcorn Ears with Computer Vision to Aid Modern Breeding.*** **J. Gonzalez, K. Leach, M. Resende. Flash Talk. Annual Univ. of Florida Plant Breeding Retreat – Virtual Meeting.**	**Aug 2020**
[1st Place Award] ***Use of Computer Vision to Quantitatively Screen Leaf Blight Resistance in Sweet Corn.*** **J. Gonzalez, K. Leach, M. Resende. Graduate Student Oral Presentation. SACNAS's Southeastern Regional Symposium – Gainesville, FL.**	**Feb 2020**
[Travel Award] ***Use of Computer Vision to Quantitatively Screen Leaf Blight Resistance in Sweet Corn.*** **J. Gonzalez, K. Leach, M. Resende. Graduate Student Oral Presentation. 4th UF Plant Science Symposium: Big Data in Plant Science – Gainesville, FL.**	**Jan 2020**
[Travel Award] ***Use of Computer Vision to Quantitatively Screen Leaf Blight Resistance in Sweet Corn.*** **J. Gonzalez, K. Leach, M. Resende. Poster Presentation. National Association of Plant Breeders Annual Meeting – Pine Mountain, GA.**	**Aug 2019**
[2nd Place Award] ***Integrating Genomics and Phenomics to Improve Sweet Corn Leaf Blight Resistance.*** **J. Gonzalez, K. Leach, M. Resende. Oral Presentation. Plant Molecular and Cellular Biology Workshop – Daytona, FL.**	**May 2019**
[3rd Place Award] ***Insights into Dothideomycetes Genetics using Short and Long Read Genome Sequencing Technology.*** **J. Gonzalez, M. Resende. Graduate Student Oral Presentation. 34th MANRRS National Conference – Kansas City, Kansas.**	**April 2019**
[Travel Award] ***Insights into Dothideomycetes Genetics using Short and Long Read Genome Sequencing Technology.*** **J. Gonzalez, M. Resende. Graduate Student Oral Presentation. Florida Phytopathological Society Annual Meeting – Hastings, FL.**	**March 2019**

[1st Place Award] ***De novo hybrid assembly of Dothideomycetes genomes.*** **J. Gonzalez, K. Leach, M. Resende. Flash Talk. Annual Univ. of Florida Plant Breeding Retreat – Virtual Meeting.** **Aug 2018**

[1st Place Talk & 1st Place Poster] ***A Proteomics Analysis on Muscadine Grape Drought Stress.*** **J. Gonzalez, R. Katam. Graduate Student Oral and Poster Presentation. FAMU's Research Experience for Undergraduates Symposium – Tallahassee, FL.** **Aug 2014**

========== Research Awards

NSF I-Corps Hub – Research Innovation and Consumer Research	**2024**
UF/IFAS High Impact Publication Award	**2022**
Great Minds in STEM Scholar	**2021**
National Association of Plant Breeders Diversity Scholar	**2019**
Grinter Fellowship – University of Florida	**2018 – 2019**
Graduate School Funding Award – University of Florida	**2017 – 2021**
Board of Education Fellowship – University of Florida	**2017 – 2018**
NSF's Research Experience for Undergraduates. Boyce Thomson Institute, Cornell, National Science Foundation. Ithaca. NY	**2015**
Research Grant. New College of Florida CAA Student Research Funds	**2015**
Research Grant. New College of Florida Student Research & Travel Grant	**2015**
NSF's Research Experience for Undergraduates. Florida Mechanic and Agricultural University, National Science Foundation. Tallahassee, FL.	**2014**