Anna R. Rogers

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Analytical and focused research scientist skilled in quantitative genetics and statistics with a concentration on applications to plant breeding. Strategic thinker and executor bringing together backgrounds in genetics, data science, and field breeding as a cross-functional contributor to solve challenging problems in collaboration across teams.

CORE QUALIFICATIONS

- Quantitative Genetics
- R, Python, and SQL programming
- Leadership and Project Management
- Statistics and Data Analytics
- Plant Breeding
- Collaboration and Communication

Professional Experience

2021-Present Data Scientist, **Applied Data Science**, Bayer Crop Science

- Partnering directly with key stakeholders to develop analytics that bridge the gap between theory and practice, resulting in quick model adoption and clear opportunities for partners to engage in continued model development
- Developing scalable genotype-by-environment (GxE) interaction Bayesian models for region-specific prediction of cotton yield, length, strength, and micronaire for use in late stage advancement and commercial deployment
- Spearheading development of high resolution GxE metrics synthesizing product concepts, market value, and portfolio risk into interpretable values directly connected to customer outcomes
- Trained, validated, and deployed multi-trait region-specific Bayesian ML prediction model for Preceon Smart Corn System in partnership with Product Development Scientists
- Collaborating with Product Development Scientists to use region-specific moisture, ear and plant height metrics in late-stage corn breeding pipeline advancements and commercial deployments
- Enabling data science through time spent directly on partner teams to co-create tools that fit their needs, integrate feedback into analytics, and developing confidence in methods through close interactions
- Consulting with domain experts to create simulations for prescribing genetic roadmaps to TI pipeline
- Democratizing use of SQL querying methods and breeding program simulations via code tutorials integrating R, Python, and SQL
- Experienced in use of Github, Domino, SQL relational databases, and AWS

May-Dec 2020 **Genome Wide Selection Intern,** Bayer Crop Science

- Implemented genomic selection models for use by USDA-GEM breeding program stakeholders
- Developed Python scripting to automate SQL queries of environmental data using Google Big Query
- Experienced in using GitHub, Domino, Amazon Web Services, and SQL databases
- Communicated results throughout execution of projects and negotiated course corrections to address roadblocks and their solutions
- Conceptualized framework for imputation between low- and high-density genotyping platforms in coordination with other team members

2016-2021 **Graduate Research Associate,** Holland Lab, North Carolina State University

- Spearheaded modeling incorporating both genomic and environmental data for genomic selection in maize
- Predicted within-environment performance of multiple traits in a large cooperative using genotype-by-environment interactions using machine learning methods

- Data wrangling genomic, phenotypic, and environmental data
- Developed mixed linear models using ASReml, R, and Echidna MMS
- Webscraped US government databases using Python
- Coordinated between geneticists, data scientists, and field researchers to improve quality or genomic, in-field phenotypic, and environmental data
- Tailored illustration of statistical models and implications of analyses to multi-disciplinary stakeholders
- Consulted on statistical analysis and experimental design in plant breeding, forestry, and biochemistry
- Examined relationships between environmental conditions and germplasm performance
- Tailored experimental field design to provide appropriate input and power to downstream analysis
- Imputed genomic data using multiple methods (nearest neighbor, pedigree-based, Beagle)

Summer 2016 **Research Technician**, Vollbrecht Lab, Iowa State University

- Independently managed genotyping and mutant identification for 5000 maize field rows
- Selected crosses for creation of double mutant lines

2013-May 2016 **Undergraduate Research Assistant**, Muszynski Lab, Iowa State University

Biochemical analysis of maize cytokinin receptor *Zea mays Histidine Kinase1* activity in heterologous *S. cerevisiae*

- Developed quantitative assays for measuring maize hormone receptor activity in heterologous yeast system
- Optimized primers and reactions conditions for PCR and sequencing of maize mutants
- Maintained and evaluated research experiments from planting to harvest

Summer 2014 **Research Intern,** Roc Ros Palau Lab, University of Valencia

- Localization of *Arabidopsis thaliana* PGK2 GFP tagged protein using confocal microscopy
- Learned new scientific techniques while developing foreign language skills

EDUCATION

Ph.D. Genetics, North Carolina State University, Raleigh, NC, Mentor: Dr. James B. Holland,
Dissertation Title: "From Genomes to Fields: Explorations in modeling Genotype-by-Environment Interactions and Environmental Covariates in Hybrid Maize.", Expected Graduation Date: May 2021

M.S. Statistics, North Carolina State University, Raleigh, NC, 2020

B.S. Genetics, Iowa State University, Ames, IA, 2016

B.S. Statistics, Iowa State University, Ames, IA 2016

CONTINUING EDUCATION

NIH High Throughput Sequencing Summer Course, Duke University School of Medicine, Department of Biostatistics and Bioinformatics 2018

Python and SQL DataCamp Tracks, DataCamp online learning platform, 2020-2022

LEADERSHIP & SERVICE

2024 -2025 **Secretary, Government Advocacy Committee**, National Association for Plant Breeding

2022-Present **Runner and Logistics Volunteer**, Missouri Science Bowl

2024 **Women in Science Empowered**, Bayer Crop Science

- Advocating for advancement of women in STEM fields across Bayer's divisions
- Selected and coordinated candidates for sponsorship to the Women in Agribusiness Summit

2023 -2024 **Data Analytics Study Group Lead**, RUNG For Women, St. Louis, MO

- Leading study groups for women without college degrees looking to enter careers in data and technology

- Connecting learnings to real world applications and leveraging networks to help launch women's careers

2022 **Genome Design Workshop Organizing Committee**, Bayer Crop Science

- Organized hybrid workshop that brought colleagues from across the globe together to showcase current research in the Genome Design Initiative
- Arranged networking and breakout sessions to engage attendees in cross-functional collaborations

2019-2020 **Research Recognition Chair**, All-Council Graduate Student Association, North Carolina State University

- Conceptualized framework for analysis pipelines and mobilized team members skill sets to execute tasks
- Redesigned judging criteria for applications and evaluated outcomes of bias in awards given

2019-2020 **Vice President**, Genetics Graduate Student Association, North Carolina State University

2018-2020 **Plant Breeding Club**, North Carolina State University

- Guided graduate peers through execution of statistical analyses in GWAS, QTL mapping, genomic selection 2018-2020 **Recruitment Co-Chair**, Genetics Graduate Student Association, North Carolina State University
- Organized recruitment of new talent to graduate program
- Moderated discussion sessions at annual Genetics Graduate Student Symposium

2018-2019 **President**, Genetics Graduate Student Association, North Carolina State University

- Launched outreach efforts to both community and potential recruits while in leadership
- Actively utilized stakeholder feedback to implement analysis and record keeping improvements to foster easier leadership transitions

PROFESSIONAL DEVELOPMENT

2022 **Breeding Mentoring Network Mentee**, Bayer Crop Science

August 2020 **Developing Interview Skills Workshop** sponsored by Bayer and Corteva, Virtual NAPB Meeting.

October 2019 **Invitational Bayer Meet and Greet** organized by Emilio Oyarzabal, St. Louis, MO.

August 2019 **Developing Your Professional Brand Workshop** hosted by Bayer and Corteva, Pine Mountain, GA.

2016-2021 **Data Visualization Workshops in R, Python, Tableau,** North Carolina State University

MENTORSHIP

2023-2025 **Bayer4You University Mentoring Program**, Bayer Crop Science (3 Mentees: 1 Post Doc, 2 PhD student)

2023-2024 **Arizona Impact Scholars Program**, Bayer Crop Science + University of Arizona (2 MS student mentees)

2023-2024 Mentoring support for 4 Bayer Crop Science Intern/Co-Ops across Breeding and Biotech

Publications

Environment Specific Genomic Prediction Ability in Maize using Environmental Covariates Depends on Environmental Similarity to Training Data. **Anna R. Rogers** and James Holland, et. al. *2022, G3*

Genomic Prediction for the Germplasm Enhancement of Maize Project. **Anna R. Rogers,** Yang Bian, James Holland, et. al. *2022, The Plant Genome*

The Importance of Dominance and Genotype-by-Environment Interactions on Grain Yield Variation in a Large-Scale Public Cooperative Maize Experiment. **Anna R. Rogers**, James Holland, et. al. *2021, G3*

Selected External Presentations

Think, Then Think Again: Evolving Instruments in the Plant Breeder's Toolkit, **Anna R. Rogers**, Invited Talk & Panel at the National Association of Plant Breeders Annual Meeting in St. Louis, MO, July 22nd, 2024

Professional Society Membership

2019-2020, 2024-Present	National Association for Plant Breeding

Honors and Awards

2025	Creative Modeling Award, Bayer Internal Hackathon, for use of multi-trait Bayesian quantitative genetics modeling
2024	Top Performance Award (TPA): Co-creation of multi-trait models for pipeline advancement and commercial deployment in the Preceon Smart Corn system
2019.	Best Poster Award, North Carolina State University Genetics and Genomics Initiative Retreat
2017	Golden Chimera: Best First Year Graduate Student Talk, 41st annual North Carolina State Genetics Graduate Student Symposium
2016-2017	University Graduate Fellowship, North Carolina State University
Spring 2016	Honorable Mention, National Science Foundation Graduate Research Fellowship Program (NSF GRFP)
Fall 2015	American Airlines Education Foundation Scholarship
Spring 2015	Ruth and Clayton Swenson Award in the Sciences, Phi Beta Kappa, Iowa State University
Spring 2015	Phi Beta Kappa Honors Society