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BRYCE (BO) MEYERING

SUMMARY

I am a skilled data scientist and applications developer with an extensive background in statistical modeling, machine learning and artificial intelligence. My core strength lies in plant image analysis for phenomics, honed through years of hands-on experience in managing lab, field, and greenhouse experiments, but I am easily able to translate skills from the plant research to broader computer vision fields. I specialize in PyTorch image models, image analysis with OpenCV, mixed effects modeling, and data visualization. I am actively seeking new opportunities to expand my skills in computer vision and deep learning.

EDUCATION

Georgia Institute of Technology — *M.S. Analytics*

January 2021 – August 2024

Atlanta, GA

Coursework in machine learning algorithms, deep learning, statistical models, time-series analysis, data visualization, and relational databases. Masters practicum project focused on perennial cover crop deep learning model development and deployment.

Southeastern University — *B.S. Biology*

August 2008 – May 2012

Lakeland, FL

- Summa Cum Laude

- Alpha Chi National Honors Society

- Southeastern University Undergraduate Research Award

- Dean's List

WORK EXPERIENCE

The Land Institute — *Applications Developer*

May 2022 – PRESENT

Salina, KS

PI: Brandon Schlautman, Ph.D.

- Developing deep learning image analysis pipelines in Pytorch and Scikit-learn for phenotyping sainfoin (*Onobrychis spp.*), kura clover (*Trifolium ambiguum*), and conventional row cropping production systems. These systems are used internally in our breeding program.
- Leading the data management team for multi year USDA/NIFA and DOE grants exploring perennial cover cropping systems in annual grain production. I develop data acquisition SOPs, project wide data ontologies, and maintain deployed databases and web applications for these projects.
- Designing, building, and implementing image acquisition systems for sainfoin and kura clover seeds, leaves, and greenhouse plants. Currently working on a low-cost, small-scale portable Raspberry Pi 5 based seed imaging system.
- Managing a team of computer science interns and image annotators to generate novel, plant phenotyping image sets (utilizing LabelBox) and develop models (Pytorch, Scikit-learn).
- Performing a wide variety of machine learning and statistical modeling techniques for projects including meta-analysis, mixed effects modeling, clustering, dimensionality reduction, and regression analysis.

University of Florida — *Biological Scientist III*

April 2016 – May 2022

SWFREC Immokalee, FL

PI: Ute Albrecht, Ph.D.

- Managed a plant physiology lab and directly supervised staff, students, and visiting scholars. Procured and maintained all lab equipment, managed 2400 sqft of greenhouse space, and designed and built field equipment and machines as necessary.
- Developed data analysis pipelines in Python and R to assimilate and analyze data from various lab instruments and processes such as Li-COR gas analyzers, WinRhizoTron and root analysis software, and Dynamax hydraulic conductance machines.
- Excavated and performed image analysis on hundreds of mature, field-grown Citrus tree root systems using OpenCV.
- Investigated mechanisms of graft incompatibility and rootstock/scion interactions in citrus using machine learning, histological procedures, and fluorescence microscopy. Developed expertise in tree grafting

techniques such as inverted T-budding, cleft grafting, and bark ring grafts, and grafted well over 2000 citrus trees.

- Advised staff and grad students in programming/statistical techniques related to their research projects.

USDA/ARS — *Biological Science Technician*

March 2015 – March 2016

Fort Pierce, Florida

PI: Greg McCollum, Ph.D.

Joint position between USDA and University of Florida

- Used disarmed Citrus Tristeza Virus vectors to deliver RNAi constructs to Citrus trees infected with *C. Liberibacter asiaticus* (HLB).
- Performed qPCR diagnostic testing to determine spatial distribution of HLB in *Citrus sinensis* sweet orange trees.
- Analyzed soil extracts with reverse phase HPLC to measure the organic acid concentrations in soil extracts of citrus plots treated with anaerobic soil disinfestation.

USDA/ARS — *Biological Science Technician*

July 2012 – February 2013

Fort Pierce , Florida

PI: Michael Bausher, Ph.D.

- Conducted field experiments to test the efficacy of tomato grafting in conventional and organic commercial farms in South Florida.
- Led a grafting project to understand and measure the compatibility of tomatoes grafted to approximately 150 related species within *Solanaceae*.
- Hand grafted over 10,000 tomato and pepper plants on experimental rootstock varieties.

USDA/ARS — *Biological Science Aid*

May 2008 – January 2012

Fort Pierce, Florida

PI: Greg McCollum, Ph.D.

- Performed DNA/RNA extractions of *Citrus* leaf tissue and qPCR analysis for diagnostic testing and gene expression.
- Assessed *Citrus kinokuni* 'Mukaku Kishu' hybrids for seedlessness related markers using RAPD primers.
- Grafted and maintained greenhouse grown trees to study the relationship between juvenile thorniness and tree height in *Citrus kinokuni*.

- Restructured, inventoried, and disease tested a Citrus variety collection which contained over 400 unique genotypes of Citrus species.

TEACHING EXPERIENCE

Interac Co., Ltd. — *Assistant Language Teacher*

March 2013 – March 2015

Mashike, Hokkaido, Japan

- Taught English as a second language in Japanese elementary and middle schools.
- Instructed Japanese adults in English night school

Southeastern University — *Chemistry Teaching Assistant*

January 2011 – May 2012

Lakeland, Florida

- Taught lab sections of organic chemistry I and II as well as biochemistry.
- Managed lab SDS and chemical inventory.

PRACTICUM PROJECT - Georgia Tech

- **Meyering, B., Schlautman, B.** RegenPGC View: Semantic Segmentation of Perennial Groundcover Cropping Systems to Restore American Croplands

  RegenPGC View was an end-to-end deep learning project for my M.S. in Analytics which focused on the detection and segmentation of perennial cover crops in row crop production systems. It encompassed all aspects of the modeling and MLOps lifecycle from data (image) acquisition, image labeling, model experimentation and development, deployment to Sagemaker, and building a Django web application for image inference. Publication in progress.

PRESENTATIONS

- **Meyering, B.**, Schlautman, B. "Data: Structure and Management". 2023 Iowa State University DataFEWsion Traineeship Symposium. Ames, Iowa. January 11th, 2023
- **Meyering, B.,** Pugina, G., Bowman, K., Albrecht, U. "Graft Compatibility of Scions with Two New Rootstocks". Florida State Horticultural Society Annual Conference, Daytona Beach, FL, September 28th, 2021.
- **Meyering, B.,** Hoeffner, A., & Albrecht, U. "Using Plant Growth Regulators to Reduce Bolting in Cilantro (*Coriandrum sativum*)". Florida State Horticultural Society Annual Conference, Orlando, FL, June, 2019.

PUBLICATIONS

Refereed Publications

- Febres, V., Fadli, A., **Meyering, B.**, Fahong, Y., Bowman, K., Chapparo, J., Albrecht, U. (2024). Dissection of transcriptional events in graft incompatible reactions of "Bearss" lemon (Citrus limon) and "Valencia" sweet orange (C. sinensis) on a novel citrandarin (C. reticulata × Poncirus trifoliata) rootstock. *Frontiers in Plant Science*. 15:1421734, https://doi.org/10.3389/fpls.2024.1421734

- Karabulut E., Erkoç K., Acı M., Aydın M., Barriball S., Braley J., Cassetta E., Craine E.B., Diaz-Garcia L., Hershberger J., **Meyering B.**, Miller A.J., Rubin M.J., Tesdell O., Schlautman B., Şakiroğlu M. (2023). Sainfoin (*Onobrychis* spp.) crop ontology: supporting germplasm characterization and international research collaborations. *Frontiers in Plant Science.* https://doi.org/10.3389/fpls.2023.1177406

- Kunwar, S., **Meyering, B.**, Grosser, J., Gmitter, F.G., Castle, W.S., Albrecht, U. (2023). Field performance of 'Valencia' orange trees on diploid and tetraploid rootstocks in different huanglongbing-endemic growing environments. *Scientia Horticulturae*. *309*, 111635. https://doi.org/10.1016/j.scienta.2022.111635

- Bodaghi, S., **Meyering, B.**, Bowman, K. D., & Albrecht, U. (2022). Different Sweet Orange-Rootstock Combinations Infected by *Candidatus Liberibacter asiaticus* under Greenhouse Conditions: Effects on the Scion. *HortScience*, *57*(1), 144-153. https://doi.org/10.21273/HORTSCI16205-21

- Bodaghi, S., Pugina, G., **Meyering, B.**, Bowman, K. D., & Albrecht, U. (2022). Different Sweet Orange-Rootstock Combinations Infected by *Candidatus Liberibacter asiaticus* under Greenhouse Conditions: Effects on the Roots. *HortScience*, *57*(1), 56-64. https://doi.org/10.21273/HORTSCI16206-21

- Castellano-Hinojosa, A., **Meyering, B.**, Nuzzo, A. *et al.* Effect of plant biostimulants on root and plant health and the rhizosphere microbiome of citrus trees in huanglongbing-endemic conditions. *Trees* **35**, 1525–1539 (2021). https://doi.org/10.1007/s00468-021-02133-8

- Pokhrel, S., **Meyering, B.**, Bowman, K. D., & Albrecht, U. (2021). Horticultural Attributes and Root Architectures of Field-grown 'Valencia' Trees Grafted on Different Rootstocks Propagated by Seed, Cuttings, and Tissue Culture. *HortScience*, *56*(2), 163-172. https://doi.org/10.21273/HORTSCI15507-20

- Albrecht, U., Bodaghi, S., **Meyering, B.**, & Bowman, K. D. (2020). Influence of Rootstock Propagation Method on Traits of Grafted Sweet Orange Trees. *HortScience*, *55*(5), 729-737. https://doi.org/10.21273/HORTSCI14928-20

- **Meyering, B.**, Hoeffner, A., & Albrecht, U. (2020). Reducing Preharvest Bolting in Open-field-grown Cilantro (*Coriandrum sativum* L. cv. Santo) through Use of Growth Regulators. *HortScience*, *55*(1), 63-70. https://doi.org/10.21273/HORTSCI14614-19

- Ampatzidis, Y., Partel, V., **Meyering, B.,** & Albrecht, U. (2019). Citrus rootstock evaluation utilizing UAV-based remote sensing and artificial

intelligence. *Computer and Electronics in Agriculture, 164*, 104900. https://doi.org/10.1016/j.compag.2019.104900
- Satpute, A., **Meyering, B.**, & Albrecht, U. (2019). Preharvest Abscisic Acid Application to Alleviate Chilling Injury of Sweet Basil (*Ocimum basilicum* L.) during Cold Storage. *HortScience, 54*(1), 155-161. https://doi.org/10.21273/HORTSCI13556-18
- Albrecht, U., Bordas, M., Lamb, B., **Meyering, B.**, & Bowman, K. D. (2017). Influence of Propagation Method on Root Architecture and Other Traits of Young Citrus Rootstock Plants. *HortScience, 52*(11), 1569-1576. https://doi.org/10.21273/HORTSCI12320-17

Industry Publications
- Albrecht, U., **Meyering, B.,** Tardivo, C., Pugina, G. (2024). Standing Up Against Hurricanes. *Citrus Industry Magazine*, June, 2024 https://citrusindustry.net/2024/06/05/standing-up-against-hurricanes/
- Albrecht, U., **Meyering, B.,** Chaparro, J., Bowman, K. (2021). Graft compatibility of new scion-rootstock combinations. *Citrus Industry Magazine,* November, 2021. https://crec.ifas.ufl.edu/media/crecifasufledu/extension/extension-publications/2021/2021_november_graft.pdf
- **Meyering, B.**, Pugina, G., Bowman, K.D., Albrecht, U. (2021). Compatibility of Scions on Two New Rootstocks. Florida State Horticultural Society Scientific Notes, Citrus Section. https://fshs.memberclicks.net/assets/docs/2021-FSHS_Proceedings-6-16-22-final.pdf

PUBLISHED DATASETS

- Meyering, B., Barriball, S., DeHaan, M., Şakiroğlu, M., & Schlautman, B. (2023). Sainfoin Pod Threshing Images (1.0.0) [Data set]. Zenodo. https://doi.org/10.5281/zenodo.10009966

TECHNICAL SKILLS

Programming and Machine Learning

- Python and R programming languages

- Relational Databases (Postgres and MySQL)

- Machine Learning and Artificial Intelligence (Pytorch, Pytorch Lighting, ScikitLearn)

- Statistical Models (GLM and mixed effects models)

- Probabilistic models (Naive Bayes, Gaussian Mixture Model)

- Dimensionality reduction (PCA, SVD, PLS, tSNE, ISOMAP, UMAP)

- Image analysis (OpenCV, ScikitImage)

- Data Visualization (ggplot2, Matplotlib, D3)

- Model deployment (AWS Sagemaker)

- Meta-analysis of experimental data

- Power analysis and experimental design

- Code version control (Git CLI, GitHub)

- Container Systems (Docker, Docker Compose)

- AWS Ecosystem (S3, EC2, Sagemaker)

- REST API Development (Postman, DjangoRestFramework)

- JupyterLab

- Web Application Development (Django, FastAPI)

- HTML5/CSS/Javascript

- Linux/UNIX systems

- Scientific imaging systems design and implementation

Clerical

- Scientific publication and technical documentation

- Technical SOP writing and design

Plant Physiology and Related Skills

- Plant histology and fluorescent microscopy techniques

- Diagnostic qPCR and gene expression analysis

- Spectrophotometric/colorimetric enzymatic and chemical assays

- Root respiration measurement and analysis

- Hydraulic conductance of plant tissue

- HPLC for soluble carbohydrates and organic acids

- Tree and vegetable grafting

COMMUNITY POSITIONS

- Crop Ontology Crop Curator - Sainfoin (*Onobrychis* spp.)

  2022-Present

  Actively develop and curate the international Sainfon crop ontology
  ([CO 369](#)) to standardize breeding and phenotypic trait terms across
  research and working groups. Contribute to community discussions about
  the future direction and maintenance of the Crop Ontology system.
  https://zenodo.org/doi/10.5281/zenodo.11475143

ACCOUNTS

- Website: bomeyering.me

- Personal GitHub: https://github.com/BoMeyering

- Work GitHub: https://github.com/TLILegume

- LinkedIn: https://www.linkedin.com/in/bo-meyering-37955b139/

REFERENCES

Available upon request