Limeng (Momo) Xie

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Education

University of Georgia (UGA) — *Athens, GA*
Phd student in Plant Biology, GPA 3.96 — *Aug 2018 - Present*
- Advisor: Dr. Alexander Bucksch, Computational Plant Science Lab

Texas A&M University (TAMU) — *College Station, TX*
Master in Horticultural Science, GPA 3.81 — *Aug 2014 - Dec 2016*
- Certificate in Applied Statistics
- Thesis: SNP Discovery and Mapping QTLs Associated with Root Traits and Morphological Traits in Tomato

China Agricultural University (CAU) — *Beijing, China*
Bachelor in Agronomy, GPA 3.65 — *Sept 2009 - May 2014*
- Thesis: Evaluation of Methane Production in Anaerobic Reactor with Sweet Potato Vine and Dairy Manure

Saga University — *Kyushu, Japan*
Exchange Student — *Oct 2011 - Aug 2012*
- Major in Plant Science and Japanese

Publications

Xie, L.,Burridge,J., Lynch, J.P., Bucksch, A. Phenotypic spectrum: uncovering root architecture diversity in common bean (*Phaseolus vulgaris L.*) *In prep*

Delory, B.M., Hernandez-Soriano, M.C., Wacker, T.S., Dimitrova, A., Ding, Y., Greeley, L.A., Ng, J.L.P., Mesa-Marín, J., **Xie, L.**, Zheng, C. & York, L.M. (2022). A snapshot of the root phenotyping landscape in 2021. *bioRxiv*.

Carley, C. N., Chen, G., Das, K. K., Delory, B. M., Dimitrova, A., Ding, Y., …, **Xie, L.** & Zheng, C. (2022). Root biology never sleeps. *New Phytologist*, 235(6), 2149-2154.

Xie, L., Klein, P., Crosby, K., & Jifon, J. (2019). A genotyping-by-sequencing single nucleotide polymorphism–based map and genetic analysis of root traits in an interspecific tomato population. *Journal of the American Society for Horticultural Science*, 144(6), 394-404.

Presentations

2022 **Xie, L.**, Burridge,J., Lynch, J.P., Kengkanna, J., Wallace, J., Hanlon, M., Bucksch, A., **ASA, CSSA, SSSA International Annual Meeting**, *Phenotypic Spectrum: A Novel Framework to Study the Root Architecture Diversity of Crop Roots at the Population Level*, Baltimore, MD

2022 **Xie, L.**, Burridge,J., Lynch, J.P., Bucksch, A., **Bayer Crop Sciences**, *Phenotypic Spectrum: A Novel Framework to Study the Root Architecture Diversity of Common Bean*, Chesterfield, MO

2022 **Xie, L.**, Burridge,J., Lynch, J.P., Bucksch, A., **North America Plant Phenoytping Network Annual Meeting**, *Phenotypic Spectrum: Uncovering Root Architecture Diversity in Common Bean (Phaseolus vulgaris .L)* Athens, GA

2021 **Xie, L.**, Burridge,J., Lynch, J.P., Bucksch, A., **ASA, CSSA, SSSA International Annual Meeting**, *Phenotypic Spectrum: Uncovering Root Architecture Diversity in Common Bean (Phaseolus vulgaris .L)*, (Poster), Salt Lake City, UT

2020 **Xie, L.**,Burridge,J., Klepp, N., Miller, J.,Lynch, J.P., Bucksch, A., **the 7th International Horticulture Research Conference**, *Quantifying diversity of root architecture types within a genotype of common bean (Phaseolus vulgaris .L)*, Online

2019 **Xie, L.**, Bucksch, A., **International Plant Phenotyping Symposium**, *The shape of plants revealed: A shape theoretic perspective on statistics of trait measurements*, Nanjing, China

2019 **Xie, L.**,Burridge,J., Klepp, N., Miller, J., Chutoe, C., Saengwilai, P., Lynch, J.P., Bucksch, A., **Crops Conference**, _The Phenotypic Spectrum: Identifying Whole Role Architecture Types in Genotypes of Common Bean (*Phaseolus*

vulgaris, L) (Poster), Huntsville, AL

2018 **Xie, L.**, Liu, S, Bucksch., A., **Plant Center Fall Retreat**, *Extracting Traits from 3D Models of Maize Root System Architecture (Poster)*, Unicoi State Park, GA

2017 **Xie, L.**, Klein, P., Crosby, K., & Jifon, J., **American Society of Horticultural Science Annual Meeting**, *Mapping Novel QTLs Associated with Root Morphological Traits in an Interspecific Tomato Population*, Waikoloa, HI

2015 **Xie, L.**, Crosby, K., & Jifon, J., **American Society of Horticultural Science Annual Meeting**, *Estimates of Genetic Variance for Drought Tolerance Traits in Tomato (Poster)*, New Orleans, LA

Honors and Awards

2022 Travel Grant, Graduate School, UGA
2022 Palfrey Travel Award, Department of Plant Biology, UGA
2022 Georgia Education Board Fellowship, UGA
2022 Gerald O Mott Award, Crop Science Society of America
2022 Best Fast-Forward Talk at North America Plant Phenotyping Network Annual Meeting
2021 1st place UGA Plant Phenotyping and Robotics Symposium Poster Competition
2021 Georgia Education Board Fellowship, UGA
2020 Palfrey Travel Award, Department of Plant Biology, UGA
2020 Travel Scholarship for Root Short Course, University of Florida
2016 Outstanding Graduate Student Award, Texas Plant Protection Association
2013 Third Prize Scholarship for Academic Excellence, CAU
2012 Japan Student Service Scholarship, Japan Student Service Organization
2011 Third Prize Scholarship for Academic Excellence, CAU
2010 Second Prize Scholarship for Academic Excellence, CAU
2010 National Encouragement Scholarship, Ministry of Education in China
2010 Merit Undergraduate Student Award, CAU

Leadership Activities

2022 Selected into competitive Emerging Leaders Program (UGA) for leadership training
2022 Organized root phenotyping workshop for UGA Institute Of Plant Breeding, Genetics, And Genomics graduate students
2021 Ambassador of International Society of Root Research |Promoted and advocated root research at the social media platform | Published meeting report in the academic journal
2021 Panelist Speaker of Women in STEM for Outreach Activities in Athens-Clarke County High School
2021 Judge for Senior Section of 73rd Georgia Science & Engineering Fair
2020 Judge Lead for Junior Section of 72nd Georgia Science & Engineering Fair
2019 Judge for Senior Section of 71st Georgia Science & Engineering Fair
2019 Executive Board Member of Chinese Genomics Online Meet-up | Responsible for inviting guest speakers and technical support for live stream
2018 Volunteer in March for Science at Washington, DC
2017 Organized tomato field day for farmers in Brazos County, Texas
2015 Secretary, Texas A&M Horticulture Graduate Student Council

Research Experience

Computational Plant Science Lab, UGA *Athens, GA*
Graduate Reserch Assistant *Jan 2019 - Present*

- Developed a computing pipeline to quantify the root architecture diversity of crop roots (common bean and maize) at the population level
- Established an Indoor-Field: A macro-mesocosm system to study the field dynamics of phenotypic spectrum of common bean

Bayer Crop Science *Chesterfield, MO*

North America Breeding Intern *May 2022 - Aug 2022*

- Developed a root phenotyping platform for cotton breeding program
- Identified root traits that improve cotton performance in drought from control enviroment to field scale
- Presented findings to stakeholders across teams

Integrated Plant Science Program, UGA *Athens, GA*

Graduate Reserch Assistant *Aug 2018 - Dec 2018*

- Developed an image processing pipeline to automatically extract root traits from 3D models of maize root system (Rotation project at Bucksch Lab)
- Identified potential genetic regions with insulators in Bladderwort by analyzing a public RNA-seq database (Rotation project at Wallace Lab)
- Explored genetic variation of volatile content among 150 tomato accessions (Rotation project at van der Knaap Lab)

Vegetable Breeding Lab, TAMU *College Station, TX*

Lab Techician *May 2017 - Dec 2017*

- Conducted all daily operations including plant, fertilize, trellis, prune, IPM, supplies and asset acquisition to complete short term and long breeding goals over 7 greenhouses and acre-size field
- Established greenhouse trials of grafted tomatoes to study yield performance in relation to various rootstock and scion combinations
- Screened pepper hybrids for thrip resistance and performed hybrid testing at multiple locations across Texas
- Crossed pepper, tomato, melon and squash to produce hybrid seed

Vegetable Breeding Lab, TAMU *College Station, TX*

Graduate Research Assistant *Aug 2014 - Dec 2016*

- Measure morphological root traits using the WinRhizo software
- Extracted, purified, and quantified tomato DNA for GBS library
- Constructed linkage map for mapping population using R/qtl, AsMap, and Joinmap
- Mapped 29 QTLs for 12 root and shoot traits using R/qtl, WinQTLCartographer, MapQTL and QTLNetworks

Biomass Engineering Lab, CAU *Beijing, China*

Undergraduate Research Assistant *Nov 2012 - Apr 2014*

- Reutilized agricultural wastse, e.g. dairy manure and sweetpotato vine, into clean and renewable energy
- Evaluated the volatile fat acid of effluent using HPLC
- Observed dairy manure and sweetpotato vine at a ration of 2:8 could have as stable methane production

Teaching & Mentoring

University of Georgia *Athens, GA*

Teaching Assistant *2019 Fall & 2022 Fall*

- Concepts in Biology (BIOL1103), 70 students; Principles of Plant Biology (PBIO1210), 30 students
- Led lab sessions and field trips for students
- Hold office hours and graded assigned homework

University of Georgia *Athens, GA*

Mentor *2020-2022*

- Sydney Page, CURO Project: Discovery of mirconutrients content of different root architecture types in Common Bean
- Joslyn Mcklveen, CURO Project: Analysis the effect of temperature and humidity on plant development on a newly-developed mesocosm system
- Lilly Adams, REU Project: Developing a new image processing pipeline to extract root trait of Arabidopsis and identifying candidate genes for root traits using GWAS

Agricultural Extension

Center for Chinese Agricultural Policy (CCAP) *Beijing, China*

Intern *Aug 2011*

- Participated the Farmer Field School Promotion Project led by CCAP, Ministry of Agriculture, and Rand Corporation (US)
- Investigated application of pesticides and fertilizers in tomato productions in Hubei Province
- Surveyed farmers in three villages and analyzed the questionare data

China Agricultural University *Beijing, China*

Co-leader, Summer Field Program *June 2011*

- Investigated the overuse of additives in the daylily industry in Qidong County
- Surveyed with local farmers and small business owners (>200 people)
- Presented results to the local government and appeared on the local media
- Organized a workshop introducing alternative methods to preserve daylily for farmers
- Won the Excellent Investigators Team Award

Skills

Bioinformatics: NGS (GBS, RNA-Seq), Reads Alignment (Bowtie, GSNAP), SNP Calling (Tophat, VCF Tools, SamTools), Gene Expression Analysis (Cufflinks, Kallisto, Salmon).

Quantitative and Population Genetics: Polygenetic Tree, QTL mapping, Marker Assistant Selection, GWAS.

Computer and Data Sciences: Linux/Unix, Python, R, SQL, Github, Docker

Language Skills: Chinese (Native), English (Fluent), Japanese (Basic)

Professional Affiliations

Member, Crop Science Society of America, Agronomy Society of America, American Society of Agronomy
Member, North America Plant Phenotyping Network
Member, American Association for Advancement of Science
Member, American Society of Horticultural Science