William Weaver

www.WilliamWeaver.xyz

EDUCATION

PhD Candidate: Ecology and Evolutionary Biology
September 2019 - Present
University of Michigan, Ann Arbor

BA Double Major: Ecology and Evolutionary Biology; Environmental Studies
May 2017
University of Colorado, Boulder

EMPLOYMENT

University of Michigan September 2019 – Present
Department of Ecology and Evolutionary Biology
Graduate Student Instructor

University of Colorado, Boulder March 2018 – August 2019
Department of Ecology and Evolutionary Biology
Professional Research Assistant

- Developed computer vision and machine learning algorithms to fully automate basic morphological trait extraction from herbarium specimen vouchers.
- Designed, trained, and optimized convolutional neural networks and support vector machine algorithms.

Cooperative Institute for Research in Environmental Science March 2018 – April 2019
Center for Limnology
Associate Scientist

- Researched and implemented Gauss-peak spectral deconvolution methods as an alternative to high performance liquid chromatography for algal pigment analyses.
- Assisted with the development of mathematical models describing carbon assimilation and turnover in riparian consumers based on isotopic discrimination.

Colorado State Senate – Denver, CO January 2017 – May 2017
Policy Research Intern

- Researched energy and environmental legislation for the 2017 Colorado legislative session, drafted bill packets, managed town halls and community outreach events, took minutes of Senate committee hearings, regularly interacted with constituents and legislators via phone, email, and in person.

Cooperative Institute for Research in Environmental Science 2015 – 2018
Center for Limnology
Laboratory Technician

- Operated and maintained analytical equipment including segmented flow analyzer, ion chromatograph, and specialized gas chromatograph.
- Conducted water quality analyses testing amounts of chlorophyll, phosphorus, nitrogen, hardness, dissolved organic carbon, total suspended solids, dissolved metals, and ash-free dry mass. Safely handled hazardous acids, bases, and organic solvents.

Field Technician

- Collected field data including water samples using a Van Dorn sampler, depth profile measurements using a YSI multiparameter sonde, Secchi disk depths, streamflow measurements, macroinvertebrates, periphyton, and zooplankton.
- Operated a truck with trailer and motorboat.

University of Colorado, Boulder September 2015 – February 2018
Faculty Laboratory **–** Dr. Stacey Smith
Research Assistant

- Used molecular phylogenies and comparative phylogenetic methods to infer patterns of trait evolution and species distributions for North American plant species. NSF funded project included in-house genetic sequencing and large-scale analysis of NEON population database and NCBI published sequences.

University of Colorado Boulder Libraries August 2013 – May 2016
Preservationist – Archives and Special Collections

- Assisted with preservation efforts required to maintain UCB's extensive collection of rare and irreplaceable media.
- Performed minor repairs on books and novel media.
- Constructed custom enclosures for vellum books, first edition texts, and newsprint.

TEACHING

University of Michigan, Ann Arbor
Department of Ecology and Evolutionary Biology
Graduate Student Instructor

- EEB 500 – Woody Plants Identification Lab – Frontiers Field Course Summer 2021
- Three sections of BIO 171 – Introduction to Biology Fall 2020
- Two sections of BIO 173 – Introduction to Biology Lab Fall 2019

PUBLICATIONS

Weaver, W. N., J. Ng, and R. G. Laport. 2020. LeafMachine: Using machine learning to automate leaf trait extraction from digitized herbarium specimens. Applications in Plant Sciences 8(6): e11367. doi:10.1002/aps3.11367

Ng, J., **Weaver, W.N.** and Laport, R.G. 2019. Testing Darwin's Naturalization Conundrum using phylogenetic relationships: generalizable patterns across disparate communities? *Diversity and Distributions*. 25(3):361-373

ORAL PRESENTATIONS

Unlocking the Vault: Machine Learning Methods for the Mobilization of Data from Millions of Plant Images

- U of M Data Science & AI Summit 2022 – Ann Arbor, MI Winter 2022

Modular Machine Learning Methods for End-to-End Automated Phenotypic Trait Extraction from Digitized Herbarium Vouchers

- Botanical Society of America – Anchorage, AK Summer 2022

Time to Get Into Shape: Using Machine Learning to Explore Leaf Morphology Among the White Oaks

- Morton Arboretum Tree Talks, *Invited Speaker* – Chicago, IL October 25, 2021

LeafMachine: Using machine learning to automate phenotypic trait extraction from herbarium vouchers

- Botanical Society of America – Tucson, AZ — Summer 2019
- Ecological Society of America – New Orleans, LA — Summer 2018

POSTER PRESENTATIONS

Rise of the machines: does plant apathy affect machine learning applications, too?

- Botanical Society of America – Tucson, AZ — Summer 2019

Testing Darwin's naturalization hypothesis: phylogenetic community structure among native and non-native species

- Ecological Society of America – Portland, OR — Summer 2017
- Biological Sciences Initiative Symposium – Boulder, CO — Spring 2017
- Botanical Society of America – Savannah, GA — Summer 2016

WORKSHOPS

Using deep learning with digitized herbarium specimen image data

- Botanical Society of America – Anchorage, AK — Summer 2022

GRANTS AND SCHOLARSHIPS

National Science Foundation Graduate Research Fellowship ($138,000)	2021-2024
MIDAS Propelling Original Data Science ($25,652)	Summer 2022
Rackham Graduate School – EEB Block Grant ($2,296)	Spring 2022
Rackham Graduate School – EEB Block Grant ($1,450)	Spring 2020
Michigan Institute for Computational Discovery & Engineering Fellow ($4,000)	2019-2020
Microsoft AI for Earth Azure Compute Grant ($10,000)	January 2019
Biological Sciences Initiative Travel Grant ($700)	Summer 2017
Biological Sciences Initiative Scholar ($2,500)	2016 – 2017
Travel Grant for Botany Conference 2016 ($1,000)	Summer 2016
Biological Sciences Initiative Travel Grant for Botany Conference ($600)	Summer 2016
Undergraduate Research Opportunities Program Research Grant ($2,400)	Summer 2016
Biological Sciences Initiative BURST Research Grant ($2,500)	2015 – 2016
President Horace M. Hale Award ($14,000)	2013 – 2017
Loach Engineering Scholarship	2013 – 2014
University of Colorado Dean's List	Spring 2015 - Spring 2017

PROFESSIONAL AFFILIATIONS

Botanical Society of America (BSA)	2016 – Present
Ecological Society of America (ESA)	2016 – 2020
Colorado Native Plant Society (CONPS)	2016 – 2017