Alexander Barajas-Ritchie

Corvallis, OR

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Education

Oregon State University **Corvallis, OR**
Ph.D., Computer Science *Expected Graduation: Spring 2026*

Sonoma State University **Rohnert Park, CA**
B.S., Computer Science *2016 – 2021*

Area of Interest

- Energy Systems
- Data Science
- Microgrids
- Environmental Engineering
- Renewable Energy
- Sustainability

Research

Marine Microgrids **Corvallis, OR**
Oregon State University *2021 – Present*
- Supervisor: Dr. Eduardo Cotilla-Sanchez
- Developing the WEC-GRID software which easily intergrates WEC modeling on Power Flow solvers such as PSSE and pyPSA.
- The aim of the software is to allow grid operators to test Wave Energy Converter (WEC) model performance within their existing grid topology by using relevant case studies.

Evaluating QSM Trees from Terrestrial Laser Scan **Rohnert Park, CA**
Sonoma State University *2020 – 2021*
- Supervisor: Dr. Lisa Bentley, Biology Department
- Developed and maintained a Python script for semi-automated conversion of point cloud data from Terrestrial Laser Scanner into individual QSM tree files for biomass calculations.
- Provided training to graduate students and faculty from other majors in Jupyter Notebook and terminal use.

Capture the Flag (CTF) Analysis **Rohnert Park, CA**
Sonoma State University *2019 – 2020*
- Supervisor: Dr. Mark Gondree, Computer Science Department
- Analyzed DEF-CON's Capture the Flag game data to extrapolate successful strategies using Python.
- Verified team attack strategies using linear algebra libraries to identify scoring patterns.
- Converted DEF-CON's Scoreboard database from Postgres to SQLite3.

Sumba Micro-grids Analysis **Rohnert Park, CA**
Sonoma State University *2019*
- Supervisor: Dr. Daniel Soto, Geography and Environmental Planning Department
- Analyzed energy consumption patterns on micro-grids for understanding consumption on a larger scale for local grid operations.
- Utilized Pandas for data cleaning and visualization of energy consumption patterns.
- Computed the average loss of purchased energy per household, per site.

Publications

Open-Source Steady State Integration of Wave Energy Converter Models into Microgrids:
Alexander Barajas-Ritchie, Derek Jackson, Eduardo Cotilla-Sanchez and Yue Cao. *Future Energy Solutions (FES 2023)*, Conference Paper, 2023.

Using terrestrial laser scanning to evaluate non-destructive aboveground biomass allometries in diverse Northern California forests: **Paris Krause, Brieanne Forbes, Alexander Barajas-Ritchie, Matthew Clark, Mathias Disney, Phil Wilkes and Lisa Patrick Bentley**. Journal Paper, 2023.

Optimizing Quantitative Structure Model (QSMs) Parameters for Coastal Redwoods (Sequoia sempervirens) for Accurate Aboveground Biomass Estimates: **Alexander Barajas-Ritchie, Dr. Lisa Patrick Bentley, Paris Krause, Brieanne Forbes**. *SSU McNair Scholars Research Journal, Volume 12: 2020-21*, Journal Paper, 2021.

Conferences, Presentations & Panels

UMERC$^+$METS Conference: Fall 2022
"Integration and Demonstration of Marine Energy Models with Microgrid Software"

McNair Returning Graduate Student Panel: Fall 2021
Participated in the "McNair Returning Graduate Student Panel", discussing the application process and choice of schools.

Quarantine Workspace: Winter 2020
Provided guidance on efficient workspace setup during quarantine in "Quarantine Workspace," STEMbyte MESA Tutor Presentations.

Computer Science Note Taking: Spring 2020
Presented on effective note-taking strategies for Computer Science courses at all levels in "Computer Science Note Taking," STEMbyte MESA Tutor Presentations.

Staying Organized with Technology: Fall 2019
Shared organization tips using technology in "Staying Organized with Technology," STEMbyte MESA Tutor Presentations.

Work Experience

Oregon State University	**Corvallis, OR**
Graduate Reseach Assistant	*2021 – Present*
WattTime	**Oakland, CA**
Software Developer Consultant	*2020 – 2021, 2023 – Present*
Sonoma State University	**Rohnert Park, CA**
Undergraduate Research Assistant	*2018 – 2021*

Leadership & Service

2019 – 2021: President & Vice President, Sonoma State Computer Science Club

Professional Teaching Experience & Mentoring

Mathematics, Engineering and Science Achievement (MESA) **Sonoma State University**
Student Tutor, Rohnert Park, CA *2018 – 2021*

Mathematics, Engineering and Science Achievement (MESA) **Sonoma State University**
Student Mentor, Rohnert Park, CA *2019 – 2021*

WattTime **Oakland, CA**
Software Developer   Summer Intern *2020*

Relevant Coursework

- International Energy Policy
- Machine Learning
- Discrete Structures for CS
- Computer Architecture
- Parallel Computing
- Operating Systems
- Theory of Computation
- Differential & Integral Calculus I
- Intro to Computer Organization

- Programming I & II
- Software Design & Development
- Computer Architecture
- Elementary Applied Linear Algebra
- Global Environmental Issues
- Data Structures
- Algorithm Analysis
- Database Management

Skills

- Programming: C/C++, Python, Julia
- Development Environments: Jupyter, VS-CODE, CLion, PyCharm
- Scripting: Bash

- Data Analysis: Pandas
- Version Control: Git/GitHub

- Database Management: SQL / SQLite

Awards & Honors

- Rising Doctoral Institute Program
- McNair Scholars Program
- The Louis Stokes Alliance for Minority Participation (LSAMP)
- TRIO Member

- Technology Coordinator
- Tutor
- Honors MESA
- MESA Honors

References

Dr. Eduardo Cotilla-Sanchez
Associate Professor, Associate Head for Graduate Programs, Electrical & Computer Engineering, Oregon State University
Email: ecs@oregonstate.edu

Dr. Bryson Robertson
Associate Professor / Co-Director, Pacific Marine Energy Center, Oregon State University
Email: bryson.robertson@oregonstate.edu

Dr. Daniel Soto
Assistant Professor, Sonoma State University
Email: sotod@sonoma.edu
Dr. Lisa Bentley
Assistant Professor, Sonoma State University
Email: lisa.bentley@sonoma.edu