

Willow Ross Carretero Chavez

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Summary

Biologist, software engineer, and all-around nerd who lets her curiosity get the best of her. Interested in applications of computation to structural, systems, cell, and infectious disease biology. Multiple years' software engineering experience with extensive knowledge of Linux, Docker, and Kubernetes. Fluent in R, Python, Java, Golang, English, and Spanish. Experience with foundational molecular biology techniques in sterile conditions.

Education

Massachusetts Institute of Technology

Cambridge, MA

- Cumulative GPA: 4.7
- Graduating Fall 2024 with a B.S. in Biology
- Relevant Coursework
 - Computer Science: Fundamentals of Programming, Math for Computer Science
 - Chemistry: Organic Chemistry I, Intro to Biological Chemistry
 - Biology: Genetics, Cell Biology, Molecular Basis of Infectious Disease, Molecular Biology

Mater Dei Catholic High School

Chula Vista, CA

- Cumulative GPA: 4.63
- Graduated May 2019

Professional Experience

Google

Seattle, WA (Remote)

Software Engineering Intern

May 2023 — Aug 2023

- Became intimately familiar with Kubernetes and Google Kubernetes Engine internals
- Fleshed out proposed features for the GKE Addon Manager into complete specifications, design docs, and implementations

Massachusetts Institute of Technology

Cambridge, MA

UROP Intern @ Jensen Lab

Sep 2022 — Dec 2022

- Expanded a novel method of chemo-enzymatic retrosynthesis using Python and RDKit
- Designed and presented research poster at the 2022 Machine Learning for Pharmaceutical Discovery and Synthesis Consortium at MIT

UROP Intern @ Sinskey Lab

Feb 2021 — May 2021

- Independently carried out cell culture maintenance on human cell lines
- Performed cell counts and metabolite analysis of samples from small-scale bioreactors
- Executed nanodrop, ddPCR, qPCR, and ELISA assays for DNA and protein quantification

Wayfair

Boston, MA

Software Engineering Co-Op

Jan 2022 — Aug 2022

- Learned use diverse enterprise software tools (Docker, Kafka, Google BigQuery, Kubernetes, DataDog) and how to operate within a large team of software engineers and data analysts
- Created multiple microservice APIs using Python, FastAPI, and PostgreSQL

D. E. Shaw Research

New York, NY (Remote)

Early College Intern

Jan 2022 — Aug 2022

- Ran free energy perturbation (FEP) molecular dynamics simulations of ligand-receptor systems and analyzed their results
- Created novel method of FEP network generation using integer linear programming

Mathnasium of Mission Gorge

Santee, CA (Hybrid)

Instructor

Aug 2019 — April 2021

- Tutored elementary through high school students on topics ranging from single-digit addition to single-variable calculus
- Effectively leveraged online teaching platforms to perform engaging remote instruction

UC San Diego Skaggs School of Pharmacy

La Jolla, CA

Staff Research Associate @ Kufareva Lab

Oct 2019 — Dec 2020

- Wrote toolkit to verify, validate, and visualize Boolean models of cell signaling networks using Python and R
- Authored manuscript on the above toolkit; now published in BMC Bioinformatics as first author
- Performed analysis and visualization of TMT-MS² phosphoproteomic data using R

Volunteer @ Kufareva Lab

Jul 2018 — Aug 2018, Feb 2019 — Oct 2019

- Analyzed protein structure using the MolSoft ICM protein modeling suite, implementing a new method of protein binding pocket similarity scoring in ICMScript
- Learned and performed tissue culture, PCR, and Gibson cloning protocols

Publications

Carretero Chavez, W., Krantz, M., Klipp, E. et al. *kboolnet*: a toolkit for the verification, validation, and visualization of reaction-contingency (*rxncon*) models. *BMC Bioinformatics* **24**, 246 (2023).

Skills

Languages I speak:

- English (native)
- Spanish (native)
- French (conversational)
- Python
- R
- Golang
- Java

Tools I am proficient with:

- Micropipettor
- Biosafety cabinet
- Git + GitHub
- Kubernetes
- Docker
- Linux
- Apache Kafka

Soft skills I am proud of:

- Detail-oriented
- Curious
- Open-minded
- Effective communicator
- Knows when to ask for help
- Fast learner
- Driven by results and data

About Me

First-generation Mexican immigrant raised in San Diego, CA before transplanting to Boston, MA for college. Open and proud queer woman that loves experimental electronic music, psychedelic rock, and zipping around Boston on her highlighter yellow bicycle. Yearns for a career that is emotionally, socially, and morally fulfilling.