adalton.us
GitHub

Avery Dalton

(321) 890-2079
avery.bd@icloud.com

Scientist turned software developer with robust analytical and computational skills. Proficient in C# and Python, experienced in C++ and MATLAB. Demonstrated excellence in independent research projects. With a commitment to continuous learning and achievement, I am poised to make valuable contributions to any team.

Work Experience

Scientific Programmer/Analyst — Santa Barbara, CA
Applied Research Associates, Inc. — 07.2024 - *now*

- Feature development and bug fixes in a complex C# application, contributing across WPF and WinForms user-interfaces
- UI improvements to enhance usability, responsiveness, and visual consistency
- Develop Python and MATLAB scripts to automate testing and validation of modeling algorithms
- Integrate geospatial functionality using ArcGIS Runtime SDK for .NET, supporting interactive map layers
- Refactor legacy C++ modules to improve maintainability, stability, and performance
- Collaborate in Agile sprints with regular code reviews and Git-based workflows, deploying to production with CI/CD

Software Developer, *part-time* — Irvine, CA
Daltonian Scientific — 01.2023 - 07.2024

- Developed various software tools related to mass spectrometry analysis
- Created custom APIs for Thermo Fisher's CommonCore .NET assemblies for chromatographic Raw files
- Built a cross-platform GUI application for data visualization from quantum mechanical (i.e. text) output files
- Published a website hosting a handful of chemistry-related calculators

Graduate Student Researcher — Irvine, CA
Aerosol Photochemistry Lab, UC Irvine — 03.2020 - 06.2024

- Led research projects in the photochemistry and quantum chemistry of atmospheric molecules
- Mentored younger students in their own independent research projects
- Wrote and published peer-reviewed articles, including one as main/corresponding author
- Presented work to scientific and public audiences in platform presentations

Intern Associate Research Scientist — Jacksonville, FL
Analytical Research Division, Bacardi Martini Product Development — 01.2018 – 07.2019

- Gas & Liquid Chromatography: Performed quantitative analyses for components of distilled spirits
- Wet Chemistry: Conducted various analyses for physical properties of distilled spirit samples

Certifications & Skills

Professional Data Scientist — *DataCamp* — 09.2023

Languages: C#, C/C++, Python, MATLAB, JavaScript
Practices: MVVM, Agile (Scrum/Kanban)
Tools & Technologies: Visual Studio, Jira, Git, Slurm, Bash, MongoDB, MySQL
Scientific: Statistics, Modeling/Simulation, HPC/Slurm
Soft Skills: Leadership, Mentoring, Writing, Documentation, Public Speaking, Time Management, Project Management, Cooperation & Team Work

Education

Ph.D. Physical Chemistry	University of California, Irvine	2021 – 2024
M.S. Chemistry	University of California, Irvine	2019 – 2021
B.S. Chemistry, *Summa Cum Laude*	University of North Florida	2016 – 2018
A.A. General Studies	Eastern Florida State College	2014 – 2016

Projects

RawVision, *A Chromatography Analysis Tool* C#/WPF

This program suite is a WPF-based .NET 8 application designed for processing and visualizing chromatography data. It includes functionality for reading Thermo Fisher Raw files, extracting chromatogram and spectral data, and exporting processed data to CSV files. The program is built on two different projects aimed towards different types of instruments, namely mass spectrometers and UV/vis diode arrays. The program leverages MVVM architecture, and incorporate user-friendly features like progress windows and error handling to ensure smooth operation.

Website, Private Source Download

Chamber Instrument Management System C++/Qt

A robust application coordinating real-time data acquisition from both serial and IP connections, seamlessly integrating QCharts for dynamic visualization and time-series analysis. Designed to be a lightweight alternative to a LabView program, this application ensures continuous data integrity and accessibility by automatically storing readings in a database for ongoing monitoring and analysis.

Website, GitHub Repo

DaltonView Python/Tk and C++

This simple GUI program stemmed from the need for an alternative to iteratively running the same Python script on every permutation of text output files generated in a quantum chemistry study. It is built on the Tkinter platform in Python, which is structured similarly to WinForms in C#. What started as a fun side-project has now reached nearly 100 downloads, and is proving to be a useful tool in the niche field of excited-state quantum and photochemistry.

Website, GitHub Repo (GUI Edition), GitHub Repo (C++ CLI Edition)

Selected Publications

5) A. B. Dalton, L. M. Wingen, and S. A. Nizkorodov*, Isomeric Identification of the Nitroindole Chromophore in Indole + NO_3 Organic Aerosol, *ACS Physical Chemistry Au*, 2024.

3) A. B. Dalton*, D. A. Fishman, S. A. Nizkorodov, Ultrafast Excited-State Proton Transfer in 4-Nitrocatechol: Implications for the Photochemistry of Nitrophenols, *Journal of Physical Chemistry A*, 2023.

1) A. B. Dalton and S. A. Nizkorodov*, Photochemical Degradation of 4-Nitrocatechol and 2,4-Dinitrophenol in a Sugar-Glass Secondary Organic Aerosol Surrogate, *Environmental Science & Technology*, 2021.

Selected Presentations

Illuminating the optical properties of nitroaromatics in atmospheric environments Jun. 2024
Dissertation Defense (talk available on YouTube) *Irvine, CA*

Investigating the matrix effects in the photochemistry of atmospheric nitrophenols Mar. 2023
ACS Spring Conference (talk) *Indianapolis, IN*

Photosensitized degredation of secondary organic aerosol by nitrophenols Oct. 2022
American Association for Aerosol Research conference (talk) *Raleigh, NC*

Influence of solvent on the electronic structure and photochemistry of nitrophenols Jun. 2022
Informal Gathering on Atmospheric Science and Photochemistry (poster) *Irvine, CA*

Photochemical candy: Use of isomalt as a proxy for glassy organic aerosol Dec. 2021
PACIFICHEM Conference (talk) *Virtual*

Awards and Fellowships

Faculty Endowed Fellowship	University of California, Irvine	2024
Dissertation Fellowship	University of California, Irvine	2024
Contributions to the Department Teaching Program	University of California, Irvine	2023
Student Travel Award	American Association for Aerosol Research	2022
ACS Undergraduate Award in Physical Chemistry	University of North Florida	2017