

Bing O'Dowd

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EXPERIENCE

- Bayer AG** Remote, Germany
Software Engineer April 2022 - Present
 - **Built and maintained two internal applications** for small molecules research and development using Typescript, Terraform, AWS Lambda, Postgres, AWS AppSync, GraphQL, and React on a four person team, performing code reviews, pair programming and using agile methodology
 - **Established automated testing workflows and shared knowledge:** improved developer velocity and confidence by building front end tests, local integration tests, and end-to-end tests, and shared practices with other software development teams
 - **Developed features which return the lineage of a molecule** by casting the problem as a graph and applying a breadth first traversal to the graph to provide the user with the lineage of a molecule of interest
- Bayer AG** Monheim am Rhein, Germany
Data Scientist October 2020 - April 2022
 - **Analyzed experimental data and built machine learning models** to support small molecule research process
 - **Lead development on API to track machine learning predictions** across iterative rounds of active learning, by using SQLite, FastAPI, Docker, and Pytest, which is used by internal data scientists across 4 projects
 - **Received performance award for leading analysis and development of dashboard:** identified previously untracked effects across 20,000 biological tests, and built dashboard to visualize results with Python, Streamlit, and AWS (EC2, S3, Docker, and ECR)
 - **Led analysis and built machine learning models**, one example being a Random Forest model for chemical projects, classifying desirable molecules at ~70% accuracy and 93% recall compared to the baseline of manual selection of compounds which yielded ~30% accuracy
 - **Lead developer of internal tools** implemented from the literature – Conformal Predictors and Random Matrix Discriminant
 - **Pioneered use of active learning** by leading and persuading chemical project leaders to pursue active learning as a strategy for using machine learning prediction outputs
- Bayer AG** Monheim am Rhein, Germany
PostDoc October 2018 - October 2020
 - **Researched, developed, and published work** on a variational autoencoder model for modeling molecular properties and generating chemical structures (<https://chemrxiv.org/articles/preprint/7977131/2>)
 - **Jointly developed and maintained** a variational autoencoder in Python and PyTorch in a 3-person team, and also applied the model in active chemical discovery projects
 - **Co-inventor on patent application** for novel molecules by using a generative model and assisting in the selection of ideas for synthesis and testing and later confirmed to be novel and of interest – “Novel heteroaryl-substituted pyrazine derivatives as pesticides” (pending)
- Dow AgroSciences** Champaign, IL, USA
Software Engineer, Intern March - August 2017
 - **Led refactoring and further development** of data cleaning pipeline to speed up data ingestion process, from annual and manual updates, to weekly and automated updates
 - **Sped up 3D similarity searches** by automating 3D molecular similarity searches by building one interface to three separate programs, and used Python’s multiprocessing library, making a week-long manual process run in < 4 hours
- University of Illinois at Urbana-Champaign** Champaign, IL, USA
Research Assistant August 2013 - May 2018
 - **Introduced Machine Learning for chemical research to the lab and used ML to direct synthetic efforts:** Ruled out 31% of possible molecules to synthesize using PCA and a generalized linear model to prioritize chemistry efforts and reduce time (ca. 6mo-1yr) and financial costs
 - **Published work in academic journals:** Discovered new a class of bacterial enzyme as an antimicrobial drug target, characterized novel inhibitor activity, and demonstrated previously unknown mechanism of action of bisphosphonates against cancer cell lines

PROJECTS

- **Verse (2023) 🐙**: CLI app written in Go to fetch Bible verses by requesting and parsing HTML from a website
- **Command line app to automate building slide deck on Google Slides (2021) 🐙**: Scraped lyrics for songs from a site with song lyrics and automated putting them into Google slides via Google Slides API for a local church

EDUCATION

- **University of Illinois at Urbana-Champaign** Champaign, IL, USA
Ph.D. Chemistry *2013 – 2018*
- **University of California, San Diego** La Jolla, CA, USA
B.S. Chemistry *2008 – 2012*

SKILLS

- **Programming languages**: Python, Typescript, Go
- **Tools/Technologies**: Terraform, AWS, GitHub Actions, Git, Docker, React
- **Languages**: English (native), German (B1), Mandarin Chinese (conversational)