NIKOLAS ACHATZ

Software Engineer & Mathematician

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EXPERIENCE

Graph Machine Learning Researcher

The Ensemble Lab

June 2021 – Present Corvallis, OR

- Original NSF funded ($̃500,000) research utilizing deep graph neural networks to predict gas adsorptions of covalent organic frameworks through their molecular structure
- Implemented Bayesian optimization and active learning with a material recommendation system (collaborative) to assess and solve the cold start problem
- Developed multi-task learning to predict multiple gas adsorptions for each crystal structure utilizing spatial graph convolutions
- Maintain and update a covalent organic framework dataset repository used to train message passing neural networks with fellow researchers
- Multitude of lectures/seminars given to the group including spectral graph convolutions, matrix factorization, recommendation systems, multitask learning, and transfer learning
    - Tools: Python, PyTorch, PyTorch Geometric, and Julia

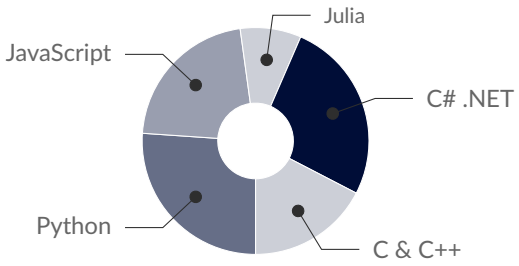
Software Developer

TeachEngineering

March 2021 – Present Corvallis, OR

- https://www.teachengineering.org/ngss_visualization
- Lead full stack developer for the visualization tool that takes advantage of powerful force-directed graph drawing algorithms including Kamada Kawa
- Designed and implemented data analysis and predictive models for user analytics
- Revamped curriculum recommendation system using natural language processing utilized site-wide
- Integrated the visualizer into the main web page through dynamic graph drawing parameterization
- Redeveloped search engine utilizing Azure Cognitive Search
- Extensive work with Azure infrastructure and developing/using APIs
- Setup and maintained the entirety of the visualizer's backend VIA RavenDB (NoSQL)
- Developed and hosted numerous production APIs serving as the backbone for the entire tool
    - Tools: C#, C++, .NET Core, Azure, JavaScript, Python, and NOSQL

PROGRAMMING



EDUCATION

B.S. in Computer Science
Systems and Mathematics (ABET)

Oregon State University

CS GPA: 4.0
Institutional GPA: 3.75
Magna Cum Laude

AWARDS

National Science Foundation REU
Funded REU recipient for summer 2021 (≈ $500,000)

Engineering Dean's List
Awarded to individuals with a 3.75+ GPA in engineering (2018, 2019, 2020)

TOOLS & SKILLS

Linear Algebra | Calculus | PyTorch | TensorFlow | Cuda | Conda | R

Azure | AWS | React | TypeScript | Node.js | .NET Core | JSON & REST | SQL & NoSQL

EXTRACURRICULAR

Artificial Intelligence Club
Vice-President

Game Development Club
Artificial Intelligence Group

PHILANTHROPY

Designed, created, maintained, and hosted the website for the Annual March for Black Mental Health awareness event. Lead promoter for the annual philanthropic event to bring awareness to the cause.

PUBLICATIONS

Journal Articles

- Achatz, N., Gavin, T., Waqar, F., & Fern, X. (2022). **[In-Progress]** multi-task learning on limited data sets with message passing neural networks. *Chemistry of Materials*.