

Alec F. Helbling

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Education

Georgia Institute of Technology | 3.93 GPA

August 2018 – Present

Bachelor of Science in Computer Science

Expected Graduation, December 2022

Experience

IBM Research

May 2021- August 2022, May 2022-August 2022

AI Research Intern | Foundations of AI Reasoning Group

- Designed algorithms for reducing the complexity of knowledge graphs for single and multi-document summarization using unsupervised learning techniques based on optimal transport theory
- Used Pytorch Geometric for processing Graph Neural Networks and BERT Transformers for representing document graphs in an NLP Pipeline

Microsoft Azure Intune

May 2020 - August 2020

Software Engineering Intern | Insight and Analytics Group

- I designed a distributed data analytics pipeline using a microservice architecture for efficient load balancing of incoming events for Intune's mobile device management services
- The changes resolve the classic noisy neighbor issue(lack of use case isolation), and saves >\$10,000 per month in server costs due to reduced latency in addition to securely isolating customer data and improving system administration experience

NASA Jet Propulsion Laboratory

May 2019 - August 2019

Summer Intern | Machine Learning and Instrument Autonomy Group

- Implemented methods of visualizing and interpreting large datasets using classical machine learning approaches for applications like studying geological information from the Mars Rover
- Utilized React.js and Redux for front end development, python websockets for the backend, and python for machine learning modeling to allow for dynamic data querying, visualizations of random forests and decision trees, and the iterative labeling of unlabeled datasets

Georgia Institute of Technology

January 2019 – Present

Student Researcher | Sensory Information Processing Lab(SIPLab) / CORE Robotics Lab

- Developed deep learning approaches to generative modeling using variational autoencoders and information theory, and novel approaches to searching their learned representation
- Designed differentiable decision tree neural network architectures using pytorch for reinforcement learning robotic applications

University of Pittsburgh School of Medicine

March 2016 – August 2018

Student Researcher and Javascript Programmer | Department of Computational and Systems Biology

- Implemented interpretable visualizations of Convolutional Neural Network based deep learning models to find drug candidates for protein structures. (See publication below)
- Developed a Javascript WebGL based molecular visualizations library called 3Dmol.js with hundreds of users and over 450 stars on Github (see at <https://github.com/3dmol/3Dmol.js>)

Publications

Title - Oracle Guided Image Synthesis with Relative Queries

April 2022

International Conference on Learning Representations

Workshop on Deep Generative Models for Highly Structured Data

- First author on a paper focusing on controlling the generative process of Variational Autoencoders
- We ask users queries of the form "do you prefer image A or image B?" Using the information from these queries we can generate recommendation images that match user preferences

Title - Visualizing Convolutional Neural Network Protein-Ligand Scoring

September 2018

Journal of Molecular Graphics and Modeling

- Co-authored a paper more than 50 citations on visualizing deep learning methods for discovering novel drugs using 3D analogs of convolutional neural networks (traditionally computer vision approaches)
- See at <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6343664/>

Skills

Programming(proficient in): Python, C, C++, Java, C#, Javascript, Node.js, React.js, HTML, CSS

Software Tools: Tensorflow, Pytorch, Caffe, Numpy, React.js, Numpy, Docker, Linux, Git, Bash, SSH, Unity