Dennis J. **Loevlie**

Machine Learning Engineer · Graduate Student Researcher

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"If you invent a breakthrough in artificial intelligence, so machines can learn, that is worth 10 Microsofts." - Bill Gates

Education

Carnegie Mellon University — *Pittsburgh, PA*

M.S. in Chemical Engineering, GPA: 3.91 — *Sep. 2019 - Dec. 2020*

- Competed in several hackathons including the Covestro Hackathon, Hack the Northeast, and the Pitt Challenge.

West Virginia University — *Morgantown, WV*

B.S. in Chemical Engineering, cum laude — *Sep. 2016 - Aug. 2019*

- Graduated with Presidential Honors from the WVU Honors college.

Skills

Machine Learning	Computer Vision, Natural Language Processing, Time Series Analysis, Deep Learning
Data Science	Feature Engineering, Data Visualization, Database Design
Software	Git/GitHub, PyTorch, Tensorflow, spaCy, Sklearn, Django, Beautifulsoup, Selenium, Numpy, Matplotlib, Pandas
Programming Languages	Python, MATLAB, JavaScript, HTML, CSS, SQL, LaTeX
Soft Skills	Leadership, Problem Solving, Communication, Writing

Experience

AithELITE — *Pittsburgh, PA*

Lead Data/Software Engineer — *May. 2021 - PRESENT*

- Recruited and interviewed prospective data/software engineers.
- Provide expertise in technical decisions made by the company.
- Communicate with the team and develop code to keep the EliteAI (AithElite's main application) working smoothly.

AithELITE — *Pittsburgh, PA*

Data/Software Engineer — *Dec. 2020 - May. 2021*

- Developed web scraping scripts using Beautifulsoup and Selenium to automate data retrieval and updating.
- Developed and automated the feature engineering with Numpy and Pandas.
- Applied machine learning algorithms using Numpy and SkLearn to generate intelligent predictions and insights from the data.
- Built and maintained relational (MySQL) and graph (Neo4J) databases, hosted on AWS.
- Built the frontend and backend of the AithELITE EliteAI website with Django, hosted on AWS.

Projects

Question Answering Model — *CMU Course*

Natural Language Processing

- Developed models using SpaCy that can generate questions from a provided text and also find answers to questions about a given text.

Disparity Map Generation — *CMU Course*

Deep Learning

- Modified the PSMnet architecture for disparity map generation to be used for 3D object detection.
- Implemented asymmetric convolutions that led to a 25% reduction in the model parameters with negligible change in the 3-pixel accuracy.

Speech Recognition — *CMU Course*

Deep Learning

- Implemented a feed forward neural network for speech recognition on audio recordings (utterances) of variable length.

Speech to Text Transcription — *CMU Course*

Deep Learning

- Implemented a combination of recurrent neural networks (RNNs) (more specifically BLSTMs) and dense networks to design a system for speech to text transcription.

ASL Active Learning

Personal Project

Deep Learning

- Developed a GUI that uses machine learning techniques such as a vanilla convolutional neural network (CNN) classifier and YOLOv3 object detection to tell a user if they have correctly signed a letter in American sign language.

Research Experience

Computer-Aided Nano and Energy Lab (CANELa)

University of Pittsburgh

Graduate Student Researcher

June. 2021 - PRESENT

- Applying quantum/statistical mechanics through Density Functional Theory and Boltzmann statistics and mixed integer optimization using the genetic algorithm to better understand structure property relationships for metal nanoparticles and ligand-protected nanoclusters.
- Organized and presented in several machine learning and software development meetings within the CANELa research group. A few of my notable presentations were on version control using git/GitHub, an introduction to PyTorch and logistic regression, and developing custom Python packages.

The Kitchin Group

Carnegie Mellon University

Graduate Student Researcher

Dec. 2019 - Dec. 2020

- Recreated image analysis tools in Python (originally in Mathematica) to be interactive, fast, and intuitive.
- Trained and deployed a convolutional neural network classifier to extract valuable information from experimental image data.
- Developed a Python package, nb_search, to efficiently sort through, locate and open Jupyter Notebook files.
- Regressed parameters and used them to cluster different bimetallic catalysts.

Control, Optimization and Design for Energy and Sustainability (CODES)

West Virginia University

Undergraduate Researcher

Apr. 2017 - Aug. 2019

- Modeled, optimized and economically evaluated a chemical process in MATLAB — Funded by the National Science Foundation.

Honors & Awards & Activities

Carnegie Mellon University

2020	**3rd Place**, Chemical Engineering Masters Student Assosiation (ChEMSA) Reserach Forum, Poster Competition	*Pittsburgh, PA*
2020	**1st Place**, The Pitt Challenge, "Largest Impact on Healthcare Workers" Category	*Pittsburgh, PA*

West Virginia University

2019	**1st Place**, AVEVA's National Simulation Competition (Advanced Category)	*Morgantown, WV*
2019	**Vice President**, American Institute of Chemical Engineers (WVU Chapter)	*Morgantown, WV*
2018	**2nd Place**, Computing and Process Control Division at the National 2018 AIChE Poster Presentations	*Morgantown, WV*
2018	**Member**, Omega Chi Epsilon Chemical Engineering Honor Society	*Morgantown, WV*

Publications

Resolving Electrocatalytic Imprecision in Atomically Precise Metal Nanoclusters

Pittsburgh, PA

Current Opinions in Chemical Engineering

Nov. 2021

- Electrocatalysis applications of ligand-protected nanoclusters.
- Prospective section on current and possible future applications of machine learning in the field.

Relevant Courses

2021	**Natural Language Processing**, Carnegie Mellon University (cross-registration), Graduate	*Pittsburgh, PA*
2020	**Introduction to Deep Learning**, Carnegie Mellon University, Graduate	*Pittsburgh, PA*
2020	**Introduction to Machine Learning**, Carnegie Mellon University, Graduate	*Pittsburgh, PA*
2019	**Linear Optimization (supply chain focused)**, Carnegie Mellon University, Graduate	*Pittsburgh, PA*
2017	**Numerical Methods and Optimization**, West Virginia University, Undergraduate	*Morgantown, WV*