

Dennis J. Loevlie

SENIOR COMPUTER VISION AND MACHINE LEARNING ENGINEER

☎ 724-841-8769 | ✉ loevliedenny@gmail.com | 🏠 www.loevlieDL.com | 📱 loevlie | 📺 DennisLoevlie | 📧 Dennis Johan Loevlie

Education

Carnegie Mellon University

M.S. IN CHEMICAL ENGINEERING, GPA: 3.91

Pittsburgh, PA

Sep. 2019 - Dec. 2020

West Virginia University

B.S. IN CHEMICAL ENGINEERING, CUM LAUDE

Morgantown, WV

Sep. 2016 - Aug. 2019

- Graduated with Presidential Honors from the WVU Honors college.

Research Experience

Computer-Aided Nano and Energy Lab (CANELa)

University of Pittsburgh

GRADUATE STUDENT RESEARCHER

June 2021 - Dec. 2022

- Applied mathematical models, Boltzmann statistics, and mixed integer optimization to predict crucial material properties of metal nanoparticles
- Organized and presented in several machine learning and software development meetings within the CANELa research group. Notable presentations include: version control using git/GitHub, an introduction to PyTorch and logistic regression, and developing custom Python packages.
- Mentored members of the group (grad and undergrad) about public [🔗 - <https://tinyurl.com/mme2v6fr>] and private code I have developed, as well as, building and evaluating ML models.

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 [🔗 - <https://tinyurl.com/yzpperdc>], 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.

Publications

Salem, M., Loevlie, D. J., & Mpourmpakis, G. (2023). Single Atom Alloys Segregation in the Presence of Ligands. *The Journal of Physical Chemistry C*, 127(46), 22790-22798. DOI: 10.1021/acs.jpcc.3c05827
Available at: <https://doi.org/10.1021/acs.jpcc.3c05827>

Loevlie, D. J., Ferreira, B., & Mpourmpakis, G. (2023). Demystifying the Chemical Ordering of Multimetallic Nanoparticles. *Accounts of Chemical Research*, 56(3), 248-257. Impact Factor: **18.3**. DOI: 10.1021/acs.accounts.2c00646
Available at: <https://doi.org/10.1021/acs.accounts.2c00646>
Code available at: https://github.com/mpourmpakis/CANELa_NP

Ding, R., Padilla Espinosa, I. M., Loevlie, D., Azadehranjbar, S., Baker, A. J., Mpourmpakis, G., Martini, A., & Jacobs, T. D. B. (2022). Size-dependent shape distributions of platinum nanoparticles. *Nanoscale Adv.*, 4(18), 3978-3986. DOI: 10.1039/D2NA00326K **Award:** Selected for the **2022 Popular Advances collection**.
Available at: <http://dx.doi.org/10.1039/D2NA00326K>

Nagarajan, A. V., Loevlie, D. J., Cowan, M. J., & Mpourmpakis, G. (2022). Resolving electrocatalytic imprecision in atomically precise metal nanoclusters. *Current Opinion in Chemical Engineering*, 36, 100784. DOI: <https://doi.org/10.1016/j.coche.2021.100784>
Available at: <https://www.sciencedirect.com/science/article/pii/S2211339821001167>

Invited Talks

Computer Vision for UAVs [🔗 - <https://shorturl.at/cvIOP>]

Pittsburgh, PA

XCHANGEIDEAS PITTSBURGH

- Presented a technical seminar, attended by over 150 professionals, focused on the value of deep learning in solving complex computer vision tasks.

Volunteering and Outreach

Present	Mentorship , Provided guidance for a youth robotics team working on developing tools for blind soccer players.	Volunteering
2022	Fundraising , Organized a profit sharing event with Chipotle to raise funds for people suffering from flooding in Pakistan	Leadership
2022	Outreach , Helped organize and volunteered at an outreach event with a local public school to help encourage students to pursue STEM	Leadership
2021	STEM Education , Volunteered at the Carnegie Science Center, where I conducted science experiments with and answered questions from elementary students	Volunteering

Work Experience

KEF Robotics

Pittsburgh, PA

SENIOR COMPUTER VISION AND MACHINE LEARNING ENGINEER

Apr. 2024 - PRESENT

- Led a team of five engineers on a one-year, \$500K project funded by the National Advanced Mobility Consortium (NAMC).
- Led the development of efficient edge-computing methods for object detection, monocular depth prediction, integration of Lockheed Martin's REAL-SA communication protocol, and 3D map generation from monocular camera images and poses. Successfully showcased these capabilities in-person at Fort Moore to an army platoon and a two-star general.

COMPUTER VISION ENGINEER

Jan. 2023 - Apr. 2024

- Enhanced hazard detection for UAVs with Mask2Former, a transformer-based universal image segmentation model. After fine-tuning the model using PyTorch and an in-house dataset of simulation images, it successfully segmented challenging thin obstacles (e.g. power lines) in real-world EO/IR images. Power line detection and avoidance was an unsolved problem at KEF before I integrated this network into our software.
- Implemented a solution that made Mask2Former compatible with PyTorch 2.0, via a successful pull request to the Hugging Face Transformers library. This enhancement, coupled with my integration of a custom backbone, led to a significant 45% boost in inference speed.
- Developed a tethered UAV interface after conducting an HCI literature review for autonomous vehicles, followed by iterative refinements based on user-testing feedback from 10 employees, enhancing interface design and user experience.
- Developed a method of automatically labeling KEF's object detection training datasets using Grounding DINO, a combination of the Transformer-based detector DINO with grounded pre-training. I then ported the model to TensorRT, leading to a 2x increase in inference speed.

AithELITE

Pittsburgh, PA

LEAD DATA SCIENTIST/SOFTWARE ENGINEER

May. 2021 - Jan. 2023

- Recruited and interviewed prospective data/software engineers.
- Maintained and improved upon the AI prediction algorithm and website frontend / backend through implementing consumer feedback.

DATA SCIENTIST/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 the frontend and backend of the AithELITE EliteAI website with Django, hosted on AWS.

Projects

GPT4Readability [🔗 - <https://shorturl.at/tKY58>]

Personal Project

NATURAL LANGUAGE PROCESSING, DEEP LEARNING

- Developed a package that leverages large language models (LLMs) with a vector database to generate a comprehensive README.md file and suggest code improvements for any GitHub repository.

SkinsAI [🔗 - <https://shorturl.at/cqsuB>]

Pitt Challenge Hackathon

COMPUTER VISION, DEEP LEARNING

- Developed a free-access, diagnosis tool for classifying moles as benign or malignant.

Disparity Map Generation [🔗 - <https://shorturl.at/bizA4>]

CMU Course

COMPUTER VISION, DEEP LEARNING

- Modified the PSMnet architecture for disparity map generation leading to a 53.65% reduction in parameters and a higher 3-pixel accuracy on IR images.

Speech to Text Transcription [🔗 - <http://tinyurl.com/3m7rph7u>]

CMU Course

DEEP LEARNING

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

Honors & Awards & Activities

2022 **2nd Place**, The Pitt Challenge, built SkinsAI which was awarded 2nd place overall out of 24 teams

Pittsburgh, PA

CARNEGIE MELLON UNIVERSITY

2020 **3rd Place**, Chemical Engineering Masters Student Association Research Forum, Poster Competition

Pittsburgh, PA

2020 **Category Winner**, 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

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