

NATALIE CYGAN

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PROGRAMMING LANGUAGES

Extensive programming experience in C++, C, Python, and Java. Project experience with Swift, React Native, and HTML/CSS.

TOOLS/LIBRARIES

PyTorch, NumPy, Jupyter Notebook, OpenCV, LaTeX, Unix, Google Cloud Platform

Visualization: Plotly, Dash, Streamlit

LANGUAGES

Working proficiency in French

VOLUNTEER/OUTREACH

Stanford Society of Women Engineers Outreach Intern: Organized outreach events directed at young girls K-12 to increase female representation in STEM.

Denton Girls + Code: Created an organization to introduce local middle school girls to computer science skills through after school workshops in my hometown.

Code in Place: Worked with a team of Stanford professors and section leaders to launch a 5-week MOOC version of Stanford's introductory computer science class to 10,000 students during the COVID-19 lockdown. Taught a weekly discussion section over zoom as a part of the teaching team.

EDUCATION

Stanford University, Stanford, CA

M.S Electrical Engineering

SEPTEMBER 2021 - PRESENT

B.S Computer Science

SEPTEMBER 2017 - DECEMBER 2021

Relevant coursework: Machine Learning, Artificial Intelligence, Computer Vision, Natural Language Processing, Deep Generative Models, Neural Networks, Information Theory, Digital Systems Architecture, Operating Systems, Human-Computer interaction, Electronics, Neuroelectrical Engineering, Visual Computing Systems.

EXPERIENCE

EE REU Research Assistant

Stanford University, Stanford, CA

JUNE 2021 - AUGUST 2021

- Research assistant to Prof. Zara Patel and Prof. Tsachy Wiessman. Working on a device to record electrical activity from the olfactory epithelium to help diagnose smell disorders.

Software Engineering Intern

Red Leader Technologies, Palo Alto, CA

JUNE 2020 - MARCH 2021

- Interned full-time for 6 months (June - December 2020) and part-time for 3 months (January - March 2021) at an automotive lidar startup.
- Overhauled the 3D visualization stack by designing custom point cloud visualization software with Open3D. Broke out lower-level data from the processing pipeline to the visualizer. Used in live visualization, analysis, and as a critical debugging tool by the entire team.
- Built an end-to-end computer vision application using OpenCV and Plotly Dash to empirically characterize transmitted laser patterns in the far-field from an image. Used in calibration and optics development.
- Used Python and Streamlit to develop upon a lidar system control dashboard, adding logging, interactive plots, and statistics for live telemetry data.
- Assisted in writing device firmware in C to report telemetry data and interact with various sensors.
- Led research effort into characterizing point cloud rotational aberrations, built optimizers for correcting these errors in software.

Software Engineering Intern

Google, Sunnyvale, CA

JUNE 2019 - SEPTEMBER 2019

- Intern on the Visual Semantic Service team; I modernized heavily used face feature landmarking software by researching active shape models, and rewriting the pipeline with optimized math libraries (C++, Eigen) and standardized programming style.
- Introduced unit tests, wrote testing tools, and created documentation for further developing the FaceSDK pipeline.

CS 106 Section Leader

Stanford University, Stanford, CA

APRIL 2018 - JANUARY 2020

- Taught weekly discussion sections for students in CS 106A, CS 106B, and CS 106X in Java, Python, and C++.
- Graded student homework assignments with extensive feedback on code functionality and style, and held 15-minute code individual code review sessions with them.
- Held weekly office hour shifts to help students debug their code and understand course material. Helped with preflighting new assignments and maintaining internal documentation for other section leaders.
- Led workshops and evaluations involved in the training of new section leaders.

PROJECTS

SBERT for Interperable Topic Modeling in Web Browsing Data

JANUARY 2021 - MARCH 2021

- Capstone project for CS 224N: Natural Language Processing with Deep Learning. Built a pipeline to leverage the expressive potential of BERT for topic modeling within a diverse set of documents (browsing data). Demonstrated this method's superiority to traditional document embedding and topic modeling techniques.

Learning to Groove: Conditional Melody Generation from Authentic Basslines

OCTOBER 2019 - DECEMBER 2019

- Final project for CS 236: Deep Generative Models. Generated artificial music tracks with a dual LSTM model: a bassline model that is trained first and provides rich encodings, and a melody model that conditions generation upon those bass encodings. We also present a novel encoding scheme for representing polyphonic music.