

LOUIS LARSEN

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EDUCATION

Princeton University

Class of 2024

- Bachelor of Arts in Computer Science, Minor in Music Composition, GPA: 3.222
- Relevant Courses: Machine Learning, Algorithms and Data Structures, Programming Systems

SKILLS

- **Programming Languages:** Python, Java, C, ARM Assembly Language, JavaScript, SQL, Go
- **Artificial Intelligence/Machine Learning:** Transformers, CNNs, RNNs, LSTMs, PyTorch
- **Software Development:** Algorithm Optimization, Parallel Computing, GUI Development
- **Web Development:** Full-Stack Programming, Webserver Setup & Deployment, HTML, CSS, Flask
- **Music:** Drum Set, Keyboards, Composition, Songwriting, Engineering/Production

ACADEMIC PROJECTS

The Development of a Drum Identification and Transcription Tool

September 2023 – May 2024

Senior Thesis

Advisor: Dr. Adam Finklestein

- Developed a novel approach to Automatic Drum Transcription (ADT) using a combination of CNNs and a 2-layer Hierarchical Encoder-Decoder Transformer
- Analyzed drum audio along the frequency and time axes, improving transcription accuracy and achieving state-of-the-art results, recognized as the best in the world, scoring 35% better than previous ADT models

The Great Princeton Raccoon Invasion

September 2023 – December 2023

Computer Graphics Final Project

Professor: Dr. Adam Finklestein

- Created a 3D single-player game with a team of 3 implementing a complete physics engine featuring collisions, gravity, and spatial sound, providing a realistic and immersive gaming experience

The Development of a CNN for the Classification of Drum Sounds

February 2023 – May 2023

Junior Independent Work

Advisor: Dr. Brian Kernighan

- Designed and implemented a CNN to classify sub-instruments of a drum set, including kick drums, snare drums, tom drums, and cymbals, achieving a testing accuracy of 94%

Academic Work Time Estimator

February 2023 – May 2023

Advanced Programming Techniques Final Project

Professor: Dr. Robert Dondero

- Collaborated with a team of 4 to design a website that helped Princeton students estimate weekly coursework hours for informed course selection

PROFESSIONAL EXPERIENCE

Research Assistant

June 2024 – August 2024

Olin College of Engineering

Boston, MA

- Expanded the existing AI-based music generation program developed with Dr. Diana Dabby by creating a GUI to improve usability and accessibility for non-technical users
- Built and deployed a server for efficient communication between the GUI and AI algorithm.
- Improved the efficiency of the underlying code, reducing processing time by 90%

AI Programming Intern

June 2023 – August 2023

Olin College of Engineering

Boston, MA

- Collaborated with Dr. Diana Dabby to develop a program which incorporated chaos theory and AI algorithms to generate diverse variations of popular songs, optimizing both musicality and randomness

CAMPUS ACTIVITIES

Stage Manager

Princeton University Rock Ensemble

Percussion Section Leader

Princeton University Orchestra

Pit Orchestra Percussionist

Princeton Triangle Club, Princeton University Players

Employer Engagement Student Assistant

Princeton Center for Career Development