Evan M. Matthews

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RESEARCH INTERESTS

My research interests lie in the intersection of artificial intelligence and human-computer interaction, with a focus in audio and signal processing. In particular, I work to make AI tools more accessible and user-friendly through my background as a musician. With ethical concerns growing in the field of AI/ML, I hope to contribute as a means to provide transparency and accountability for development of new models. And most importantly, I aim to make the future of AI models better assist the user as opposed to growing fears of replacing them.

EDUCATION

- **University of Illinois Urbana-Champaign**   *August 2023 - May 2025*
  MS in Computer Science   Urbana, IL
  - Area(s): Artificial Intelligence, HCI
  - Thesis: ***Text-to-Audio Generation Improvement through Text Prompt Recaptioning***
    "With the rise of Audio Generation through machine learning, the task of training such models for improvement has drastically increased the amount of time and computational resources needed to produce good results. Inspired by developments in Text-to-Image training, I propose training a text-to-text model to translate or 'recaption' prompts to improve model generation for any Text-to-Audio model."
  - Advisor: Prof. Paris Smaragdis
  - Selected Courses: Machine Learning for Computer Vision, Computer Vision, Machine Learning for Signal Processing, Data Mining, Topics in Computer Education, Numerical Analysis,

- **University of Illinois Urbana-Champaign**   *August 2023 - May 2025*
  BS in Computer Science + Music, High Honors   Urbana, IL
  - GPA: 3.76/4.00
  - Selected Courses: Machine Learning, Data Structures, Algorithms, Computer Vision, Music Theory, Music Composition

- **Metamora Township High School**   *May 2019*
  High School Diploma, High Honors   Metamora, IL
  - Chess Team, Wind Ensemble, Jazz Ensemble, National Honor Society, Cross Country, Private Math Tutor
  - GPA: 3.93/4.00

PROFESSIONAL EXPERIENCE

- **Haken Audio [ ]**   *November 2021 - August 2022*
  Product Manufacturer   Champaign, IL
  - Manufactured and tested electronic components for the Continuum Fingerboard, a unique electronic music instrument.
  - Managed by Lippold Haken, "one of five leading individuals to have remodeled the musical human-machine interface since 1900."
  - Helped to develop new procedures to increase efficiency and reduce waste in the manufacturing process.

UNIVERSITY APPOINTMENTS

- **Teaching Assistantships**
  University of Illinois Urbana-Champaign   Urbana, IL
  - CS 545 Machine Learning for Signal Processing - Prof. Minje Kim (Fall 2024)
  - CS 448 Audio Computing Laboratory - Prof. Paris Smaragdis (Spring 2024, Spring 2025)
  - CS 340 Introduction to Computer Systems - Prof. G. Carl Evans (Fall 2023)
  - ECE 402 Electronic Music Synthesis
    - Prof. Zuofu Cheng (Fall 2022)
    - Prof. Lippold Haken (Spring 2022)

OTHER TEACHING EXPERIENCE

- **Public Math Tutor** *June 2023 - May 2024*
  Illinois Tutoring Initiative Normal, IL
  ◦ Tutored high school students in Algebra I through a post-COVID state education initiative.

- **Undergraduate Mentor** *Fall 2022, Fall 2024*
  ACM @ UIUC, WCS Urbana, IL
  ◦ Guided undergraduate students through college life, including schedule organization, work-life balance, and thriving in a new environment

- **Session Lecturer** *October 2022 - March 2023*
  CS SAIL, UIUC Urbana, IL
  ◦ Lectured high school students on productivity with popular organizational tool *Notion*

- **Private Math Tutor** *2018 - 2019*
  Metamora Township High School Metamora, IL
  ◦ Tutored middle, high school students in Algebra I and Geometry

PROJECTS

- **Senior Capstone: Transcribing Monophonic Audio with Deep-Learning Data** *Spring 2023*
  Python, MIDI/Musicxml, MuseScore [🌐]
  ◦ Advisor: Zuofu Cheng
  ◦ Dataset collection and setup for Audio-to-MIDI models

- **Absentea** *Spring 2022*
  SQL, React.js
  ◦ Final project for CS 411; database webapp designed for comparing schedules and absences between members of an organization or group. Inspiration taken from scheduling sites like When2meet and Doodle.

- **DISSCO** *Fall 2021 - Spring 2022*
  C++, Linux [🌐 ⭕]
  ◦ Advisor: Sever Tipei
  ◦ DISSCO, or Digital Instrument for Sound Synthesis and Composition, is a Linux-based program combining music composition and sound synthesis for the easier creation of stochastic and non-stochastic music.

- **Disklavier Echo Effect** *Fall 2021 - Spring 2022*
  Python, rtmidi, musx [⭕]
  ◦ Course project for MUS 305, under the course direction of Prof. Heinrich Taube. The program runs using the musx library and uses threading to run real-time outputs to a Yamaha Disklavier.

- **Pan-Lang** *Spring 2020*
  React, JavaScript [🌐 ⭕]
  ◦ Second prize winner at PYGHACK 2020: a food pantry webapp designed providing translated lists and descriptions to patrons of Champaign and Urbana-area foodbanks.

- **Spotigraph** *Fall 2020*
  C++, Spotify API
  ◦ Final project for CS 225; makes use of graph traversal algorithms to find the kth degrees of a given Spotify artist.

PUBLICATIONS J=Journal, T=Thesis

[**T.1**] **Evan Matthews**. (*ongoing*). "Audio Generation Improvement through Text Prompt Recaptioning".

[**J.1**] Craig Zilles, Yuxuan Chen, Chenyan Zhao, **Evan Michael Matthews**, Matthew West (2024).
"A Case for Bayesian Grading". [🌐]

TECHNICAL WORKS

[**1**] **Evan Matthews***, Vikram Ramavarapu*, Krishnaveni Unnikrishnan* (*ongoing*).
"Untitled Predictive Model for Internet Addiction".

[**2**] Dwip Datal*, Adheesh Juvekar*, **Evan Matthews***, Jiachen Tu* (*ongoing*).
"Untitled Analysis of Image Generative Shadows and Reflections".

[**3**] **Evan Matthews** (May 2023). "Optical Music Recognition for LilyPond File Generation". [🌐]

[**4**] **Evan Matthews***, Nic Prate* (December 2023).
"Nearest Neighbor Classification for Classical Image Upsampling". [🌐 ⭕]

* Equal authorship

SKILLS

- **Data Science & Machine Learning:** PyTorch, Sklearn, Numpy, Scipy, Pandas, Matplotlib
- **Programming Languages:** Python, C/C++, Java, Rust, OCaml, Bend
- **Web Technologies:** Flask, Hugo, Discord
- **DevOps & Version Control:** Github, Git
- **Specialized Areas:** Audio Computation, Audio Production, Music Composition
- **Other Tools & Technologies:** LaTeX, MuseScore, LilyPond, Notion, Linux, Windows, MacOS

HONORS AND AWARDS

- **James Scholars Program** *May 2023*
  UIUC College of Fine and Applied Arts [⊕]
- **University Dean's List** *Fall 2019, Spring 2020, Spring 2021*
  University of Illinois Urbana-Champaign [⊕]
- **CS 125 Impressive Project** *Fall 2019*
  University of Illinois Urbana-Champaign [⊕]
  ◦ Awarded for Android Studio project *WarioWare!* during my first semester at UIUC.

LEADERSHIP EXPERIENCE

- **Co-Chair, SIGMusic** *August 2023 - Present*
  ACM @ UIUC [⊕]
  ◦ Organized and led lectures on topics in audio computation, signal processing
- **Treasurer** *May 2022 - May 2023*
  ACM @ UIUC [⊕]
  ◦ Managed finances for organization and two student-led conferences; led year-long room renovation project
- **Co-Chair, Social Committee** *August 2021 - May 2022*
  ACM @ UIUC [⊕]
  ◦ Led volunteer teams and organized social events for the CS/engineering community
- **Board Member, Student Advisory Board** *August 2021 - May 2023*
  UIUC School of Music
  ◦ Advised the School Director on decisions to enrich and engage with the music student community

PROFESSIONAL MEMBERSHIPS

- **IEEE, Signal Processing Society** *January 2025 - Present*
- **Association for Computing Machinery** *September 2023 - Present*
- **University of Illinois Alumni Association** *June 2023 - Present*

ADDITIONAL INFORMATION

Languages: English (Native), Spanish (Intermediate), Mandarin (Elementary)
Interests: writing music, hammocking, strategy games

REFERENCES

1. **Paris Smaragdis**
   Associate Head and Professor, Siebel School of Computing and Data Science
   University of Illinois Urbana-Champaign
   paris@illinois.edu
   Thesis Advisor, TA Professor

2. **Lippold Haken**
   Professor Emeritus, Electrical and Computer Engineering
   University of Illinois Urbana-Champaign
   l-haken@illinois.edu
   (217) 333-4206
   Manager, TA Professor

3. **Minje Kim**
   Associate Professor, Siebel School of Computing and Dat Science
   University of Illinois Urbana-Champaign
   minje@illinois.edu
   Research Mentor