Enhao Zhang

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Education

- **University of Washington** Seattle, WA
  Ph.D in Computer Science *Sept. 2020 – Present*
  - Advisor: Prof. **Magdalena Balazinska** and Prof. **Ranjay Krishna**
- **University of Michigan** Ann Arbor, MI
  Bachelor of Science Engineering in Computer Science *Sept. 2018 – Apr. 2020*
  - Overall GPA: 4.00/4.00
  - Advisors: Prof. **Nikola Banovic** and Prof. **Michael Cafarella**
- **Shanghai Jiao Tong University** Shanghai, China
  Bachelor of Science in Electrical and Computer Engineering *Sept. 2015 – Aug. 2020*
  - Overall GPA: 3.97/4.00 (Ranking: 1^{st}/202)

Publications

- Self-Enhancing Video Data Management System for Compositional Events with Large Language Model. **Enhao Zhang**, Nicole Sullivan, Brandon Haynes, Ranjay Krishna, Magdalena Balazinska. SIGMOD 2025 (to appear). [Paper][Code]
- VOCALExplore: Pay-as-You-Go Video Data Exploration and Model Building. Maureen Daum, **Enhao Zhang**, Dong He, Stephen Mussmann, Brandon Haynes, Ranjay Krishna, Magdalena Balazinska. VLDB 2024. [Paper][Code]
- EQUI-VOCAL: Synthesizing Queries for Compositional Video Events from Limited User Interactions. **Enhao Zhang**, Maureen Daum, Dong He, Brandon Haynes, Ranjay Krishna, Magdalena Balazinska. VLDB 2023. [Paper][Code]
- EQUI-VOCAL Demonstration: Synthesizing Video Queries from User Interactions. **Enhao Zhang**, Maureen Daum, Dong He, Manasi Ganti, Brandon Haynes, Ranjay Krishna, Magdalena Balazinska. VLDB 2023 Demo. [Paper]
- VOCAL: Video Organization and Interactive Compositional AnaLytics. Maureen Daum*, **Enhao Zhang***, Dong He, Magdalena Balazinska, Brandon Haynes, Ranjay Krishna, Apryle Craig, Aaron Wirsing. CIDR 2022. (* indicates equal contributions) [Paper]
- Method for Exploring Generative Adversarial Networks (GANs) via Automatically Generated Image Galleries. **Enhao Zhang**, Nikola Banovic. CHI 2021. [Paper][Website]

Honors and Awards

- **Madrona Prize** (Recognizing the most commercializable research project) (☞ Link), Paul G. Allen School of Computer Science & Engineering, UW, 2022
- **Cheng Family Scholarship**, Joint Institute, Shanghai Jiao Tong University, 2018
- **Interdisciplinary Contest in Modeling**, Honorable Mention, 2017
- **Distinguished Academic Achievement Award** (Academic performance in the top 2% of class), Joint Institute, Shanghai Jiao Tong University, 2016
- **Undergraduate National Scholarship** (Top 7 students in Joint Institute), Ministry of Education of People's Republic of China, 2016

Research and Work Experience

- **University of Washington** Seattle, WA
  Research assistant | Advisors: Prof. Magdalena Balazinska, Prof. Ranjay Krishna *Sept. 2020 – Present*
  - **VOCAL-UDF**: Built a self-enhancing system enabling compositional video queries without the need for predefined modules. Leveraged large language models (LLMs) with a unified data model to construct missing modules as user-defined functions (UDFs), generated both Python programs and distilled models to handle diverse visual concepts, utilized active learning to select optimal implementations, and proposed techniques to enhance LLM reliability.

- **EQUI-VOCAL**: Designed a novel system to automatically synthesize queries over videos from limited user interactions to find complex events. Introduced an expressive data model and a query language based on spatio-temporal scene graphs, employed beam search and active learning to efficiently synthesize user's intended queries from examples, and implemented a set of optimizations to reduce computational effort.
- **VOCALExplore**: Developed an interactive system that supports users in building domain-specific models over videos, with a dynamic sampling strategy to maximize model quality, a rising bandit algorithm to select optimal video features for model training, and a task scheduler to ensure low user-visible latency.

- **Microsoft Research** Redmond, WA
  Research intern, AI Frontiers Team | Mentor: Erkang (Eric) Zhu *Jun. 2024 - Sept. 2024*
  - Optimized LLM-based multi-agent systems for sequential multi-step tasks via parallel sampling. Showed that parallel sampling with early termination reduces latency and parallel sampling with aggregation improves completion rates.

- **Snowflake** San Mateo, CA
  PhD software engineer intern, SQL Query Language Team | Mentor: Dmitry Lychagin *Jun. 2023 - Sept. 2023*
  - Developed end-to-end solutions of null handling improvements for SQL functions and operators.

- **University of Michigan** Ann Arbor, MI
  Research intern | Advisor: Prof. Nikola Banovic *Sept. 2019 – Sept. 2020*
  - **GAN Explorer:** Designed an interactive tool for Generative Adversarial Network (GAN) exploration and evaluation, where users can assess capabilities and limitations of a GAN via interactive visual examination. Used a Markov Chain Monte Carlo (MCMC) method for automated image gallery generation, which enabled quick creation of many diverse, photo-realistic image galleries to support qualitative evaluation of GANs.

Mentoring Experience

- **Current undergrad student:** Manasi Ganti
- **Past undergrad students:** Brian Yao, Chongjiu Gao, Lyons (Daoyi) Lu, Yichi Zhang
- **Past high school students:** Anish Chaudhuri, Parie Kumar

Professional Service

- **Reviewer** – CHI 2022, CSCW 2022
- **Session host** – CS Education Week, University of Washington

Tutoring Experience

- **TA, CSE 444: Database Systems Internals**, University of Washington *Winter 2023*
- **TA, VY200: Academic Writing II**, Shanghai Jiao Tong University *Spring 2017*
- **TA, VY100: Academic Writing I**, Shanghai Jiao Tong University *Fall 2016*

Skills

- **Programming Languages:** Python, C/C++, Java, SQL, JavaScript, HTML
- **Frameworks & Libraries:** PyTorch, scikit-learn, pandas, Django, PyTorch Lightning, PEFT, NVIDIA DALI
- **Other Tools:** PostgreSQL, DuckDB, Hugging Face, AWS, Docker, Git, LaTeX, Slurm