Jiyoon Pyo

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Research Interest

Geospatial AI, Multimodal reasoning, Spatial understanding, Human-centered AI applications

Education

University of Minnesota - Twin Cities *Sept 2023 – Present*
Ph.D. in Computer Science
- Advisor: Prof. Yao-Yi Chiang

University of Minnesota - Twin Cities *Sept 2023 – May 2025*
M.Sc. in Computer Science

The Cooper Union *Aug 2019 – May 2023*
M.Eng. in Electrical Engineering
- Advisor: Prof. Carl Sable
- Thesis: Detection and Replacement of Neologisms for Translation (ProQuest)

The Cooper Union *Aug 2019 – May 2023*
B.Eng. in Electrical Engineering (Computer Engineering)
- Minor: Computer Science

Publications

FRIEDA: Benchmarking Multi-Step Cartographic Reasoning in Vision-Language Models Oct 2025

Jiyoon Pyo, Yuankun Jiao, Dongwon Jung, Zekun Li, Leeje Jang, Sofia Kirsanova, Jina Kim, Yijun Lin, Qin Liu, Junyi Xie, Hadi Askari, Nan Xu, Muhao Chen, Yao-Yi Chiang

Under Review

Augmenting Human-Centered Racial Covenant Detection and Georeferencing with Plug-and-Play NLP Pipelines Sept 2025

Jiyoon Pyo, Yuankun Jiao, Yao-Yi Chiang, Michael Corey

10.1145/3764917.3771333

Exploiting LLMs and Semantic Technologies to Build a Knowledge Graph of Historical Mining Data July 2025

Craig A. Knoblock, Binh Vu, Basel Shbita, Yao-Yi Chiang, Pothula Punith Krishna, Xiao Lin, Goran Muric, ***Jiyoon Pyo***, Adriana Trejo-Sheu, Meng Ye

10.1007/978-3-032-09530-5_26

Leveraging Large Language Models for Generating Labeled Mineral Site Record Linkage Data July 2024

Jiyoon Pyo, Yao-Yi Chiang

10.1145/3687123.3698298

Current Projects

FARON: Synthetic Cartographic Reasoning Dataset *GitHub*
- Designing a synthetic dataset to rigorously benchmark the cartographic reasoning capabilities of LVLMs
- Curating complex, multi-hop reasoning steps to be used for fine-tuning and evaluating LVLMs on various spatial tasks, including GIS query comprehension and spatial relationship understanding

Enhancing Cartographic Reasoning of LVLMs through Templates

- Implementing template-based methods (e.g., structured prompting, fine-tuning) to enhance the map reasoning abilities of LVLMs
- Focusing on improving model accuracy in interpreting map-based visuals and executing spatial queries, moving beyond simple evaluation to active performance improvement

MARCIE: Improving 4D Data Comprehension of LVLMs *GitHub*

- Investigating methods to extend LVLM comprehension from static 2D images to complex 4D (3D + time) data
- Developing and evaluating techniques to enable models to reason about dynamic 3D scenes, object interactions, and temporal changes, addressing a key challenge in advanced spatial intelligence

Research Experience

Graduate Research Assistant *University of Minnesota*
University of Minnesota - Knowledge Computing Lab *Fall 2023 - Present*

Research Intern *Redmond, WA*
Reykjavik University - Language and Voice Lab *May 2022 - Aug 2022*

- Contributed to the Icelandic Language Technology 2018-2022 project by researching natural language processing (NLP) techniques for Icelandic
- Collaborated with IcelandAir to develop a multilingual customer survey sentiment analysis tool
- Evaluated the performance of IceBERT against RoBERTa and XLNet for analyzing customer feedback across different languages

Teaching Experience

CSCI4541: Introduction to Natural Language Processing *Fall 2025*

CSCI5523: Introduction to Data Mining *Spring 2025*

CSCI1913: Introduction to Algorithms, Data Structures, and Program Development *Fall 2023*

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PH291: Physics Lab *2021 - 2023*

ECE303: Communication Networks *Spring 2023*

ECE302: Probability Models and Stochastic Processes *Spring 2023*

ECE300: Communication Theory *Fall 2022*

ECE240: Circuit Analysis *Fall 2022*