

# Kezhen Chen

+1 650-885-1487 • kzchen0204@gmail.com

Immigration Status: Permanent Resident (Green Card)

Website: [www.kezhenchen.net](http://www.kezhenchen.net)

## Professional Summary

- ❖ Strong research experience in Deep Learning, Knowledge Representation&Reasoning, Neuro-Symbolic Reasoning, Vision and Language, Large-scale Multi-Modality Model.
- ❖ Published multiple *papers* on top-tier AI conferences, such as AACL, ICML, NeurIPS. Received *Best Paper Award* at KR2ML workshop, NeurIPS 2019.
- ❖ Outstanding problem solving, critical thinking, creativity, communication, and analytical skills.

## Skills & Expertise

- ❖ Programming Language – **Python, LISP, Java**
- ❖ Analytical/Scientific software – **MATLAB**
- ❖ Knowledge Graph Ontologies – **ResearchCyc, Wikidata, ConceptNet**
- ❖ Cloud Architecture – **Azure, Google Cloud**
- ❖ Research tools – **Scikit-Learn, CogSketch, SAGE**
- ❖ Deep learning tools: **PyTorch, Tensorflow**
- ❖ NLP toolkits – **Spacy, NLTK, Huggingface**
- ❖ Operating system – **Windows, Linux, MAC OS**

## Education

Northwestern University, Evanston, IL

Sept.2016 – June.2022

*Ph. D. candidate in Computer Science.*

❖ *Working in [Qualitative Reasoning Lab](#).*

❖ Research area: Knowledge Graph Reasoning, Multiple-modality understanding, Neuro-Symbolic, LLM, Analogical Reasoning

❖ PhD Mentor: [Prof. Kenneth D. Forbus](#)

❖ Research Advisors: [Prof. Dedre Gentner](#), [Prof. Bryan Pardo](#), [Prof. Han Liu](#)

University of Rochester, Rochester, NY

Sept.2012 – May.2016

*Bachelor of Science in [Computer Science](#), [Minor of Arts in Economics and in Mathematics](#)*

❖ *Highest Honor degree*

❖ Dean's List for 3 semesters (2013-2015)

❖ Research Advisors: [Prof. Jiebo Luo](#), [Prof. Henry Kautz](#), [Prof. Ehsan Hoque](#)

## Selected Publications & Research Papers

- ❖ [Kezhen Chen\\*](#), Guo, X.\*, Rao, J., Zhang, Y., Sun, B., and Yang, J. "[LOWA: Localize Objects in the Wild with Attributes](#)" preprint by *arXiv:2305.20047*, 2023
- ❖ Diji Yang\*, [Kezhen Chen](#), Rao, J., Guo, X., Zhang, Y., Yang, J., Zhang, Y. "[Tackling Vision Language Tasks Through Learning Inner Monologues](#)" preprint by *arXiv:2309.04041*, 2023
- ❖ Jiaying Lu\*, Rao, J., [Kezhen Chen](#), Guo, X., Zhang, Y., Sun, B., Yang, J. "[Evaluation and Mitigation of Agnosia in Multimodal Large Language Models](#)" preprint by *arXiv:2308.09970*, 2023
- ❖ [Kezhen Chen\\*](#), Forbus, K., Srinivasan, B., Chhaya, N., and Usher, M. "[Sketch Recognition via Part-based Hierarchical Analogical Learning](#)" accepted by *IJCAI 2023*
- ❖ [Kezhen Chen\\*](#), Forbus, K. "[Visual Relation Detection using Hybrid Analogical Learning](#)" accepted by *AAAI 2021*
- ❖ [Kezhen Chen\\*](#), Huang, Q., McDuff, D., Gao, X., Palangi, H., Wang, J., Forbus, K., Gao, J. "[NICE: Neural Image Commenting with Empathy](#)" accepted by *Findings of EMNLP2021*

- ❖ [Kezhen Chen\\*](#), Huang, Q., Palangi, H., Smolensky, P., Forbus, K., Gao, J. "[Mapping Natural-language Problems to Formal-language Solutions using Structured Neural Representations](#)" *ICML 2020*
- ❖ [Kezhen Chen\\*](#), Forbus, K., Gentner, D., Hespos, S., and Anderson, E. "[Simulating Infant Visual Learning by Comparison: An Initial Model](#)" *CogSci 2020*
- ❖ [Kezhen Chen\\*](#), Rabkina, I., McLure, M., and Forbus, K. "[Human-like Sketch Object Recognition via Analogical Learning](#)" *33th AAAI preceeding, Jan, 2019*
- ❖ [Kezhen Chen\\*](#), Huang, Q., Palangi, H., Smolensky, P., Forbus, K., Gao, J. "[TP-N2F: Tensor Product Representation for Natural to Formal Language Generation](#)" *KR2ML workshop, NeurIPS 2019 (Best Paper Award)*
- ❖ [Kezhen Chen\\*](#), Huang, Q., Bisk, Y., McDuff, D., Gao, J., "[KB-VLP: Knowledge Based Vision and Language Pretraining.](#)" accepted by *PMLR workshop ICML 2021*
- ❖ [Kezhen Chen\\*](#), Huang, Q., Smolensky, P., Forbus, K., Gao, J. "[Learning Inference Rules with Neural Tensor Product Rules](#)" *Babymind workshop, NeurIPS 2020*
- ❖ [Kezhen Chen\\*](#) and Forbus, K., "[Action Recognition from Skeleton Data via Analogical Generalization over Qualitative Representations](#)" *32th AAAI preceeding, Feb, 2018*
- ❖ M. Iftekhar Tanveer\*, Zhao, R., [Kezhen Chen](#), Tiet, Z., Hoque, E., "[AutoManner: An Automated Interface for Making Public Speakers Aware of Their Mannerisms](#)" *ACM IUI, April, 2016*

## Research and Professional Experience

---

Research Scientist, [Google X](#) (collaborated with [Google Deepmind](#)) June.2022 – present

- ❖ Conducting researches on large multi-modality foundation models.
- ❖ Developing new approaches for multi-modality instruction tuning and zero-shot open-vocabulary detection.
- ❖ Working on "AI for Science" research. Developing new multi-modality fundamental model in environment domain/earth science domain (modalities including soil, weather, terrain, language, vision, etc.)
- ❖ Exploring new efficient parameter tuning algorithms to improve the training efficiency, performance, consistency, continuous learning and reasoning abilities of large-scaled foundation models

Visiting Scholar, [UC Santa Cruz](#) Sept.2023 – present

- ❖ Conducting researches on knowledge-augmented foundation models
- ❖ Developing new AI approaches inspired by human cognition to improve reasoning, interpretability, robustness and few-shot learning abilities of LLMs

Ph.D. candidate, [Qualitative Reasoning Group Lab, Northwestern University](#) Sept.2016 – June.2022

- ❖ Built Hybrid Primal Sketch, an image cognition system with integration of deep learning models and knowledge base reasoning.
- ❖ Built an AI-based information kiosk via Microsoft Platform for Situated Intelligence. Combining computer vision and knowledge base question/answer.
- ❖ Performed human action recognition on continuous skeleton data via analogical learning models.
- ❖ Created a human-like and data-efficient approach on sketched object recognition and developed a structured representation for sketched object.

Researcher Engineer, Research Intern [Microsoft Research AI, Redmond](#) May.2019 – May.2021

Research project: Neural-Symbolic Reasoning

Advisor: Paul Smolensky, Qiuyuan Huang, Hamid Palangi, Jianfeng Gao

- ❖ Developed new deep learning models that combine the symbolic representations as inductive bias to improve the structural learning ability and reasoning ability of deep learning models.

Research project: Commonsense Multimodal Understanding

Advisor: Qiuyuan Huang, Daniel McDuff, Yonatan Bisk, Jianfeng Gao

- ❖ Created a new multi-modal architecture for commonsense vision and language question-answering by leveraging knowledge graph information via a unified fusing framework.

Research project: Image Commenting

Advisor: Qiuyuan Huang, Daniel McDuff, Jianfeng Gao

- ❖ Constructed a new vision and language task and dataset, NICE dataset, to promote models to generate emotional comments on images.

## Services

---

- ❖ Senior Program Committee, AAAI, 2024
- ❖ ACL Rolling Reviewer (ARR), 2021 - present
- ❖ Program Committee, ACL 2023
- ❖ Program Committee, EMNLP 2022 - 2023
- ❖ Program Committee, NeurIPS 2023
- ❖ Program Committee, ICML 2022 - 2023
- ❖ Program Committee, AAAI 2020 - 2023