

# KANGDA WEI

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## RESEARCH INTEREST

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Natural Language Processing, Deep Learning, Discourse Analysis, Large Language Model

## EDUCATION

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<b>Texas A&amp;M University</b> <i>Doctor of Philosophy in Computer Science</i>	College Station, TX Aug 2023 - Present
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- **Graduate Research Assistant:** Advised by Professor Ruihong Huang.

<b>The University of North Carolina at Chapel-Hill</b> <i>Master of Science in Computer Science</i>	Chapel-Hill, NC Aug 2022 - May 2023
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- **Graduate Teaching Assistant:** COMP431 Internet Service and Protocol, COMP211 System Fundamentals

<b>The University of North Carolina at Chapel-Hill</b> <i>B.S. in Computer Science, B.S. in Statistics and Operational Research</i>	Chapel-Hill, NC Aug 2019 - May 2022
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- **GPA:** 3.812/4.0

- **Relevant coursework:** Foundation of Programming, Data Structures, Algorithms and Analysis, Computational Photograph, Optimization, Structured Prediction, Machine Learning & Deep Learning, Programming Language, Time Series, Simulation Analysis, Stochastic Modeling, Linear Algebra, Computer Organization, Reinforcement Learning

### Online courses

- Stanford CS224n (NLP), Machine Learning, Deep Learning Specialization Series taught by Andrew Ng on Coursera

## RESEARCH EXPERIENCE

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<b>Is GPT a Good Annotator for Discourse-Level Event Relations?</b> <i>Texas A&amp;M University</i> <i>Research Assistant, Mentor: Prof. Ruihong Huang</i>	College Station, TX Aug 2023 - Dec 2023
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- Assessed the effectiveness of GPT in addressing discourse-level ERE tasks characterized by lengthy documents and intricate relations encompassing coreference, temporal, causal, and subevent types.
- Revealed a notable underperformance of GPT compared to the baseline established through supervised learning.
- Conducted quantitative and qualitative analysis to show that GPT model benefits from dividing intricate tasks into smaller components, however, still encounters challenges in avoiding hallucinations, satisfying transitivity rules among predictions, and capturing dependencies over long distances.
- Paper in submission to ACL Rolling Review.

<b>When Do Decompositions Help for Machine Reading?</b> <i>Johns Hopkins University</i> <i>Visiting Research Assistant, Mentor: Prof. Benjamin van Durme</i>	Baltimore, MD May 2022 - May 2023
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- Explored the effect of decomposition on machine reading with an exhaustive set of variants across a range of models over the high-level Question Decomposition Meaning Representation (QDMR) BREAK dataset.
- Discovered that question decomposition is not helpful for machine reading but rather harmful.
- Conducted a qualitative error analysis, showing that machine reading using question decomposition struggle due to compound error and question decomposition in bad formats.
- Published paper at *Proceedings of the Empirical Methods in Natural Language Processing 2023*.

<b>Leveraging Multiple Teachers for Test-Time Adaptation of Language-Guided Classifiers</b> <i>The University of North Carolina at Chapel Hill</i> <i>Research Assistant, Mentor: Prof. Shashank Srivastava</i>	Chapel Hill, NC Apr 2022 - May 2023
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- Present a framework for test-time adaptation of language explanation-guided classifiers towards a specific task during inference.

- Achieved 8% higher classification accuracy by utilizing label aggregation with language model (LM) for test-time adaptation, and three times better accuracy comparing to baselines with zero-shot learning.
- Further improved the accuracy by 20% by incorporating self-learning by fine-tuning pre-trained LM on noisy labeled data.
- Conducted qualitative analysis for framework's interpretability.
- Simplify and improve the label aggregation technique by replacing hand-written labeling functions with LM.
- Published paper at *Findings of the Empirical Methods in Natural Language Processing 2023*.

### Compositional Generalization for Kinship Prediction through Data Augmentation

The University of North Carolina at Chapel Hill

Chapel Hill, NC

Research Assistant, Mentor: Prof. Shashank Srivastava

Feb 2021 - Mar 2022

- Evaluated empirically the utility of data augmentation and intermediate structured representations towards compositional generalization for the task of kinship prediction from a story.
- Tested the impact of incorporating data augmentation and intermediate structured data on model's performance. Data augmentation boosted generalization performance by around 20% on average relative to a baseline model from prior work.
- Found that predicting and using intermediate kinship graphs led to a deterioration in the generalization of kinship prediction.
- Published paper at *Proceedings of the 4th Workshop of Narrative Understanding (WNU2022)*.

### A Multilingual COVID-19 Question Answering System

University of California, Santa Barbara

Santa Barbara, CA

Visiting Research Assistant, Mentor: Prof. William Wang

May 2021 - Aug 2021

- Established a multilingual COVID-19 Question Answering system using mBERT and XLM-Roberta models.
- Focused primarily on building and training the Reading Comprehension part of the QA system, including collecting and processing the data, and performing machine translation on large-scale natural language dataset.
- Performed large-scale neural machine translation on entire COVID-19 dataset to acquire data in Chinese and French to alleviate the data scarcity problem in foreign languages.
- Reached an F1 score of 60.5 for the reading comprehension model of the final QA system.

## PUBLICATIONS

- **Kangda Wei**, Aayush Guatam, Ruihong Huang. Is GPT a Good Annotator for Discourse-Level Event Relations? *In submission*.
- **Kangda Wei**, Dawn Lawrie, Benjamin Van Durme, Yunmo Chen, Orion Weller. When Do Decompositions Help for Machine Reading? *Proceedings of the Empirical Methods in Natural Language Processing 2023*
- **Kangda Wei**, Sayan Ghosh, Rakesh Menon, and Shashank Srivastava. Leveraging Multiple Teachers for Test-Time Adaptation of Language-Guided Classifiers. *Findings of the Empirical Methods in Natural Language Processing 2023*
- **Kangda Wei**, Sayan Ghosh, and Shashank Srivastava. 2022. Compositional Generalization for Kinship Prediction through Data Augmentation. *In Proceedings of the 4th Workshop of Narrative Understanding (WNU2022)*, pages 1319, Seattle, United States. Association for Computational Linguistics.
- \*Songhe Wang, \***Kangda Wei**, Lei Lin, Weizi Li. Spatial-temporal Analysis of COVID-19's Impact on Human Mobility: the Case of the United States, in the *20th and 21st Joint COTA International Conference of Transportation Professionals*. \*Co-author: equal contribution

## NOTABLE PROJECTS

### Email Plug-in Startup

Jan 2022 - May 2022

- Built a classification model from scratch for email classification using PyTorch and Huggingface Transformer.
- Increased the model accuracy from 0.32 to 0.84 with limited amount of annotated data.

### Cyber-infrastructure: Web-based Application for Sharing Neural Imaging Data

Sep 2020 - Jan 2021

- Built a website where users can register and login to access the neural imaging data of patients.
- Practiced the basis of front-end and back-end engineering using Python Flask and Firebase.

## SKILLS

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- **Programming Languages/Frameworks:** Python, Java, JavaScript, C, HTML, CSS, MATLAB, R, PyTorch, Linux
- **Software & Tools:** PyCharm, VS Code, Spyder, Jupyter Notebook, Tableau, Latex, Anaconda, RStudio
- **Language:** Chinese (native), English (proficient)