

# Yao ZHANG

Lehrstuhl für Datenbanksysteme und Data Mining  
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## EDUCATION

**Ludwig-Maximilians-Universität München (LMU)**

*Ph.D. in Computer Science*

**Munich, German**

*2022 - Now*

**Ludwig-Maximilians-Universität München (LMU)**

*M.S. in Computer Science (Overall GPA: 1.12/1.0, top 10%)*

**Munich, German**

*Apr 2019 - Oct 2021*

**Ludwig-Maximilians-Universität München (LMU)**

*B.S. in Computer Science with Minor in Statistics (Overall GPA: 1.24/1.0)*

**Munich, German**

*Oct 2016 - Oct 2019*

## RESEARCH INTERESTS

- Multimodal Learning and Reasoning
- Continual Learning
- Domain Adaptation
- Scene Understanding

## PUBLICATIONS

- [Y. Zhang](#) et al. Adaptive Multi-Resolution Attention with Linear Complexity, IJCNN, 2023.
- [Y. Zhang](#) et al. KNNAC: An Efficient k Nearest Neighbor Based Clustering with Active Core Detection, IIWAS, 2020.
- [Y. Zhang](#) et al. CL-CrossVQA: A Continual Learning Benchmark for Cross-Domain Visual Question Answering, under review.
- Y. Lu, [Y. Zhang](#), et al. k-Nearest Neighbor based Clustering with Shape Alternation Adaptivity, IJCNN, 2020 (**Oral**).
- Z. Han, R. Liao, B. Liu, [Y. Zhang](#), et al. Enhanced temporal knowledge embeddings with contextualized language representations, workshop at NAACL 2022.
- M. Fromm, E. Faerman, M. Berrendorf, S. Bhargava, R. Qi, [Y. Zhang](#), et al. Argument Mining Driven Analysis of Peer-Reviews, AAAI, 2021.

## RESEARCH EXPERIENCES

**Efficient Transformer** (Advisor: Prof. Dr. Volker Tresp & Dr. Yunpu Ma)

*Nov 2020 - Sep 2021*

- Proposed a novel and efficient Transformer model, which scales linearly to sequence length in terms of time and space.
- The proposed method leverages a multi-resolution multi-head attention mechanism, enabling attention heads to capture long-range contextual information in a coarse-to-fine fashion.
- Conducted extensive experiments on LRA benchmark demonstrating the effectiveness and efficiency of our method by achieving SOTA performance-efficiency-memory trade-off.
- Our model is around 10 times faster than vanilla Transformer, while 5 times smaller in GPU running memory occupation.

**Argument Mining Driven Analysis of Peer-Reviews** (Advisor: Prof. Dr. Thomas Seidl)

*Apr 2020 - Jul 2020*

- Released a dataset of peer-reviews from different computer science conferences with annotated arguments.
- Proposed an Argument Mining based approach for the assistance of editors, meta-reviewers, and reviewers.
- Conducted comprehensive experiments with BERT-based approaches, showing that argument mining can be used to extract the most relevant parts of a review in determining acceptance.
- Studied the transferability of models trained on data from different domains to the peer-review domain and the generalization across different conferences.

**Clustering Algorithm with Active Core Detection** (Advisor: Prof. Dr. Thomas Seidl)

*Sep 2019 - Apr 2020*

- Proposed a density-based clustering algorithm, which addresses the major issue of other density-based algorithms due to the use of active core detection, i.e., our method only requires performing range queries for a chosen subset of points.
- Compared to the existing density-based algorithms, our method reduces the problem complexity to the use of a single parameter k and can provide competitive performance while taking a fraction of runtime.

**Clustering Algorithm Based on Local and Global Information** (Advisor: Prof. Dr. Thomas Seidl) *Jan 2019 - Jun 2019*

- Proposed a novel kNN density-based clustering algorithm, which does not adopt the DBSCAN paradigm. Instead, the clusters are identified by maximizing the intra-cluster similarities, which are estimated using both local (i.e., k nearest neighbor) and global (i.e., the distribution of the whole dataset) information.
- The proposed method is capable of extracting clusters in arbitrary shapes using the single parameter k, and can handle a series of datasets with less parameter tuning.
- Conducted extensive experiments on both synthetic and real-world datasets, showing that our approach outperforms other recent kNN based clustering algorithms.

## **COURSEWORK & PROJECTS**

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### **Classification of the Circulation Patterns**

*Apr 2020 - Aug 2020*

- Developed several deep neural networks in PyTorch to capture spatial and temporal information in order to study how climate change affects the behavior of the two circulation patterns.

### **Implementation of an iOS App**

*Nov 2019 - Feb 2020*

- Designed an App named "GetThingsDone" using Swift.

### **Implementation of a Chess Game Client**

*Oct 2017 - Feb 2018*

- Designed a gaming client with tools like signals, pipes, and sockets using C to play chess against the university servers.
- Led a team of 4 people and took charge of algorithm development, code debugging, and deployment.

## **AWARDS & HONORS**

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**Certificate of Deep Learning series courses** | Coursera.com

*Oct 2019*

**Certificate of Machine Learning** | Coursera.com

*Jul 2019*

## **SKILLS**

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**Recently Used:** Python, PyTorch, JAX, NumPy, Tensorflow, scikit-learn

**Have Experience Before:** Swift, C/C++, R, Java, Haskell

## **LANGUAGES**

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**English:** Fluent (TOEFL: 100)

**German:** Basic (TestDaF: 18)

**Chinese:** Native language