Ziqiao Ma

Undergraduate · Computer Science · Machine Learning

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Education

University of Michigan *Ann Arbor, U.S.*

B.S. Computer Science (Dual Degree) *Aug. 2019 - May. 2021 (Expected)*

- Cumulative GPA: 4.00/4.00
- Minor in Mathematics, LSA
- Course Works: Machine Learning *(A+)*, Artificial Intelligence *(A)*, Numerical Analysis *(A+)*, Natural Language Processing *(grad, in progress)*, Deep Learning for CV *(grad, in progress)*, Computer Vision *(in progress)*

Shanghai Jiao Tong University *Shanghai, China*

B.S. Electrical and Computer Engineering (Dual Degree) *Sep. 2017 - Aug. 2021 (Expected)*

- Cumulative GPA: 3.81/4.00
- Course Works: Discrete Mathematics *(A)*, Logic Design *(A)*, Honors Mathematics *(A-, A, A-)*

Technische Universität Berlin *Berlin, Germany*

Winter Program *Jan. 2018 - Feb. 2018*

- Course Works: Programming in Java *(A)*

Research Experience

Situated Language and Embodied Dialogue (SLED) Group - University of Michigan *Ann Arbor, U.S.*

Advisor: Dr. Joyce Chai *Aug. 2020 - Present*

- Project: Exception Handling in Autonomous Vehicles via Human Language Collaboration
  - Exception learning mechanisms in traditional autonomous driving algorithms are slow or missing. The objective is to develop a smart interface that takes human language instructions and learns to handle the exceptions more efficiently.

Liu Lab - University of Michigan *Ann Arbor, U.S.*

Advisor: Dr. Jie Liu *Jan. 2020 - Present*

- Project: Spatial Cell Pattern Interpretation in T2D Islets via GNN Prediction Explanation
  - State-of-the-art Graph Neural Network explainers did well on node-wise explanation, but the label-wise community pattern interpretation is yet to be researched. We redesigned a GNN Explainer to perform label-wise explanation, validated the model on T2D islet samples and extracted predictive spatial cell patterns.
- Project: TAD level architectural stripes extraction
  - We Designed an efficient algorithm to extract TAD level architectural features from HiC.

Foreseer Group - University of Michigan *Ann Arbor, U.S.*

Advisor: Dr. QiaoZhu Mei *Sep. 2019 - Present*

- Project: Active Learning on Graph Neural Network via Graph Partitioning
  - This work is closely under preparation for publication, co-author with Jiaqi Ma, PhD of the group.
  - The community's efforts on active learning strategies on GNNs focus on feature density and general graph centrality, yet graph information is not fully exploited. We proposed an practical query strategy by graph partitioning in the perspective of influence maximization problem.
- Project: Spatial Temporal GCN on Traffic Data with Correlational Information
  - We performed simulation studies on GNN models, and concluded the incapability of GNNs to capture correlational graph information. Better performance is validated by experiment on STGCN models with linear copula loss.

Acemap - Shanghai Jiao Tong University *Shanghai, China*

Advisor: Dr. Xinbing Wang *Feb. 2019 - Dec. 2019*

- Projects: Unsupervised Keyphrase Extraction in Scholar Publications
  - We reviewed existing unsupervised keyphrase extraction methods including TextRank, PositionRank and EmbedRank, and performed experiments on Kp20k and Acemap datasets.

Selected Projects

Graph Attention Based Reasoning for Natural Language Inference *Ann Arbor, U.S.*

Advisor: Dr. Joyce Chai *Oct. 2020 - Present*

- Final project of EECS 595, Natural Language Processing (Graduate), cooperated with 2 undergraduate teammates.
- Graph-structured knowledge is powerful in Natural Language Inference tasks. We propose to use Graph Attention Networks to exploit knowledge graphs from multiple sources, and develop a graph-based reasoning framework to perform NLI tasks like Question Answering, Conversation Entailment and Plausible Inference.

Application of Generative Adversarial Networks on Image-to-Image Style Translation *Ann Arbor, U.S.*

Advisor: Dr. Andrew Owens *Oct. 2020 - Present*

- Final project of EECS 442, Computer Vision, cooperated with 3 undergraduate teammates.
- Generative Adversarial Networks are widely studied in image-to-image translation. We reproduce influential models like CycleGAN, StarGAN v1 and v2, apply them to artistic style transferring tasks and evaluate them quantitatively by FCN score.

Teaching Experience

Win. 2021 **Artificial Intelligence (EECS492, Expected)**, Instructional Aide, University of Michigan
SU. 2020 **Artificial Intelligence (VE492)**, Teaching Assistant, Shanghai Jiao Tong University
SU. 2020 **Programming & Data Structure (VE280)**, Teaching Assistant, Shanghai Jiao Tong University
SU. 2019 **Physics Lab I (VP141)**, Teaching Assistant, Shanghai Jiao Tong University
SP. 2019 **Academic Writing II (VY200)**, Teaching Assistant, Shanghai Jiao Tong University
FA. 2018 **Academic Writing I (VY100)**, Teaching Assistant, Shanghai Jiao Tong University

Selected Awards and Honors

2020 **Dean's List**, University of Michigan

2019 **Undergraduate Academic Excellence Scholarship**, Shanghai Jiao Tong University
Junyuan Tang Scolarship Nomination, Shanghai Jiao Tong University

2018 **National Scholarship**, Ministry of Education of China
Undergraduate Social Practice Scholarship, Shanghai Jiao Tong University
Second Prize of Freshmen Robotics Competition, Shanghai Smart Manufacturing In.

2017 **John Wu & Jane Sun Excellence Scholarship**, Shanghai Jiao Tong University
Undergraduate Volunteer Scholarship, Shanghai Jiao Tong University

Service and Activities

Outreach

2020 **Michigan Student Artificial Intelligence Lab**, Active Member
2019 **UM::Autonomy**, Active Member
2019 **SJTU Student Science and Technology Innovation Association**, Minister
2017 **Joint Institute Debate Team**, Active Member

Service

2019 **Young Volunteers Association**, Assistant Student Adviser
2018 **Joint Institute Student Union**, Active Member of Liaison Department

Volunteering

2018 **Bangladesh Poverty Reduction Challenge**, Active Member
2018 **Yunnan San He Junior High School Volunteer Teaching Team**, Volunteer Math Teacher

Skills

Language **Python, C/C++, Java, JavaScript, Matlab, R, Verilog, TeX**
Framework **PyTorch, TensorFlow, NLTK, OpenCV, AirSim, Networkx, jQuery, Hadoop**