

YUANMING (ALEX) TAO

✉ ytao5219@mail.com • ☎ (413) 428-8035 • 🌐 [ymtao5219](https://github.com/yymtao5219) • in [yuanmingtao](https://www.linkedin.com/in/yuanmingtao) • 📍 Amherst, MA

Education

University of Massachusetts, Amherst

Sep 2022 – May 2024 (Expected)

Master of Science in Computer Science, GPA: 3.7

Amherst, MA

- Courseworks: Responsible AI, 3D Computer Vision, Natural Language Processing, Information Retrieval, etc.

University of Sydney

Jul 2015 – Apr 2020

Bachelor of Science (First-Class Honours) in Applied Mathematics

Sydney, Australia

- Thesis: “Topic modeling as a community-detection problem”, supervised by Prof. Eduardo G. Altmann
- Courseworks: Non-Linear Optimization, Bayesian Inference, Stochastic Processes, Generalized Linear Models, Partial Differential Equations, Computational Mathematics, Abstract Algebra, etc.
- Awards: Early Researcher Scholarship to encourage undergraduate student research in complex systems
- Presented at Satellites Session, Conference on Complex Systems, Oct 2019, NTU, Singapore

Publications

On Surgical Fine-tuning for Language Encoders

EMNLP Findings, 2023

Abhilasha Lodha[^], Gayatri Belapurkar[^], Saloni Chalkapurkar[^], **Yuanming Tao[^]**, and 4 others, [^]: Equal Contribution

Multilayer Networks for Text Analysis With Multiple Data Types

EPJ Data Science, 2021

Charles C. Hyland, **Yuanming Tao**, and 4 others

Experience

UMass Graphics Lab

Jun 2023 – Present

Summer Research Intern, Prof. Evangelos Kalogerakis

Amherst, MA

- Spearheaded the innovative approach of geometry-aware editing of 2D/3D diffusion models through warping and other transformations (targeting CVPR 2024) [*diffusers*, *PyTorch*, *Flask*, *kornia*, *OpenCV*, *WebGL*, *Slurm*]

Microsoft

Feb 2023 – Jun 2023

Graduate Student Researcher, Dr. Reshmi Ghosh

Remote

- Acted as principle developer in developing a novel method for surgical fine-tuning of language encoder models based on a data-driven criteria to automatically identify and tune a smaller subset of layers using only 100 target data samples [*Huggingface*, *PyTorch*, *Slurm*, *DeepSpeed*]
- Outperformed or achieved similar performance as full model finetuning on nearly all GLUE and SuperGLUE downstream tasks, while potentially decreasing the time taken by 25%

Huawei

May 2020 – Dec 2021

Software Engineer

Hangzhou, China

- Implemented a quantisation algorithm achieving primary ray shooting on a mesh with 282K triangles at ultrawide 1080P resolution, rendered at 46 ms per frame on Kirin 9000 with Mali G78 GPU [*C++*, *Vulkan API*]
- Improved rendering accuracy and consistency by implementing a watertight ray-triangle intersection algorithm using operator fusion while maintaining the same performance [*GLSL*, *Gradle*]
- Crafted a dynamic material modeling algorithm, inspired by recent SIGGRAPH research, and integrated it into key image synthesis software [*C++*, *GLSL*, *Gradle*, *Jenkins*]

Complex Systems and Data Science Group at USYD

Dec 2019 – Apr 2020

Research Assistant, Prof. Eduardo G. Altmann and Prof. Tiago P. Peixoto

Hybrid

- Utilized Bayesian stochastic block models to categorize documents and identify topics within extensive collections of written content, taking into account metadata and hyperlinks [*sklearn*, *SpaCy*, *graph-tool*, *mediawiki API*]
- Assessed and compared various models' performance using normalized mutual information and AUC, resulting in notable enhancements (~21%) in model effectiveness

Skills

- Languages: Python, C++, Bash, R, SQL, JAVA, JavaScript, MatLab
- Web: React, NodeJS, Django, MongoDB
- Devops/Tools: Git, Docker, Kubernetes, Kafka, Elasticsearch