TOM (TIANZE) YANG

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EDUCATION

McGill University **Montreal, Canada**

M.Sc.(Thesis) in Computer Science, Supervisor: Prof. Xue Liu *Sep 2023 - present*

- GPA: 4.0/4.0

B.Sc. in Honors Probability and Statistics (DS & ML Path), Minor Computer Science *Sep 2020 - May 2023*

- GPA: 3.85/4.0

HONORS

- Master of Science Stipend (2023)
- First-Class-Honors in Probability and Statistics (2023)
- William Macdonald Scholarship (2020-2023)
- Research Assistant Stipend at XiaLab (2021-2023)
- Research Assistant Stipend at Weichenthal's Lab (2021)
- McGill Science Dean's Honor List (2020-2021)
- Wing Hing Chan Scholarships in Science (2020-2021)
- McGill Emerging Leaders Certificate (2021)
- Huawei Seeds for the Future Certificate (2021)
- Earnest Fox Award of Mechanics, Marianopolis College Scholar, Marianopolis College Entrance Scholarship (2018)
- Governor General of Canada, Bronze (2018)

RESEARCH INTERESTS

Theories and Applications of Language Model; Theories of DL/ML; Responsible LLM

PUBLICATIONS

[1] AI Clinics on Mobile (AICOM): Universal AI Doctors for the Underserved and Hard-to-Reach **(co-First Author)**
Tim Tianyi Yang∗**, Tom Tianze Yang**∗, Na An, Ao Kong, Shaoshan Liu, and Xue Liu
Under Peer-Review

[1] AICOM-MP: an AI-based Monkeypox Detector for Resource-Constrained Environment **(co-First Author)**
Tim Tianyi Yang*, **Tom Tianze Yang***, Andrew Liu, Jie Tang, Na An, Shaoshan Liu, and Xue Liu
Connection Science, IF 5.3

PROFESSIONAL EXPERIENCE

Nebula AI **Montreal, Canada**

AI Engineer *Sep 2023 - present*

- Develop Stroke prediction AI using Transformers, Decision tree, Random forest, Fisher-score, Regression, QLoRA, and Python, achieved top 1-5% accuracy.
- Develop the Model Manager plugin for ComfyUI, utilizing Node.js, Docker, HTML, and CSS, to enable custom downloading of models.
- Participated in the Chainlink Hackathon on behalf of the company
- Create Generative Art NFT using Chainlink Functions, Stable Diffusion models, Multi-Chain Storage, python, Docker, html, css, js
- Enabled LLM/Generative AI as a service on web3OS using Flask, Docker, Transformers, Python
- Develop and implement a system for generating data NFTs using Stable Diffusion, IFPS, and Python

McGill University & MILA **Montreal, Canada**

Research Intern. Mentors: Dr. Shaoshan Liu, Prof. Xue Liu *Sep 2022 - present*

- Develop a language-model-based algorithm to conduct data engineering tasks using prompting techniques, Transformers, and Pyth
- Design and optimize a LLM-based medical AI for mobile platforms, using QLoRa, LangChain, Chroma DB, TinyChat Engine
- Developed the State-of-the-Art Monkeypox Screening AI using Python Tensorflow, reached >98% accuracy and > 1000 downloads.
- Developed an AI-powered Android App using Android Studio and float-16 quantization, achieved >98% accuracy
- Designed a website featuring a Monkeypox screening AI integrated into its web interface, using Angular, Python Flask,

Google Cloud
- Entered MIT Solve challenge
- Open-sourced: link

Shenzhen Institute of Computing Science **Shenzhen, China**

Research Intern. Mentor: Dr. Weijie Ou *Jul 2023 – Sep 2023*

- Developed an LLM-based text parser using Python Transformers and Llama2-7b, achieved 70% accuracy NL2SQL task.
- Fine-tuned Llama2-7b for NL2SQL task using QLoRa and Peft, achieved 187.56% improvement in execution accuracy.
- Augmented Llama2-7b for NL2sQL task using Chain-of-Thought, few/zero-shot prompting, role-play prompting techniques, achieved 123.5% improvement in execution accuracy
- Implemented a NL2SQL engine for YashanDB using Python and BASH

RESEARCH EXPERIENCE

McGill University **Montreal, Canada**

Quantitative Risk Analyst, PI: Prof. Christian Genest *Sep 2022- Dec 2022*

- Developed a Time-Series model of the Value-at-Risk of cryptocurrencies using ARMA+GARCH framework and R
- Examined the correlation between cryptocurrencies using Copula method and R

AI Engineer, Full-stack Web Developer, PI: Prof. Jianguo Xia *Jul 2021- May 2023*

- Implemented and deployed a public academic forum named OmicsForum (with over 725 users) using discourse and docker
- Designed, trained, and deployed a RASA chat agent on MetaboAnalyst, which has been used by >500,000 researchers, using Python, JS, and JAVA
- Built a metabolomic tools search engine for SystemsAnalyst using MeiliSearch

ML Engineer, Data Analyst, PI: Prof. Suresh Krishna *May 2022 - Sep 2022*

- Processed and analyzed human visual scanpath data using Python and Matlab
- Modeled human visual search behaviour through zero-shot invariant techniques and bottom-up inverse reinforcement learning

ML Intern, PI: Prof. Jean-Baptiste Poline *Sep 2021- May 2022*

- Extracted database usage information from neuroscience articles using Linear Regression model & Sequential Neural Network model, achieved >80% accuracy
- Pre-processed neuroscience articles using data cleaning tools and Python.

ML Intern, PI: Prof. Yi Yang *Mar 2022 - Sep 2022*

- Studied and applied reinforcement Learning Techniques such as Multi-armed Bandits and finite Markov Decision Process using Python

Research Assistant, PI: Prof. Scott Weichenthal *May 2021 - Sep 2021*

- Designed routes for data collection process
- In charge of setting up equipment and collecting environmental data, such as the density of black carbon in different areas of Montreal

TEACHING EXPERIENCE

McGill University **Montreal, Canada**

Design of Experiments Math 558(Course Assistant) *Jan 2024 - present*

Honours Statistics Math 357(Course Assistant) *Jan 2024 - present*

Honours Analysis Math 254(Course Assistant) *Sep 2023 – Dec 2023*

SELECTED COURSES

* Probabilistic Analysis of Algorithms	*Intelligent Software System	*Responsible AI
*Applied Machine Learning	Database System	Artificial Intelligence
*Natural Language and Data Science	*Advanced Probability II	*Non-parametric Statistics
*Regression and Analysis of Variance	*Causal Inference	

** ≡graduate course*

SKILLS

- **Computer Science:** Python (Pytorch, Transformers, Tensorflow, Flask, NumPy, Pandas), Docker, SQL, BASH, Linux/Ubuntu, Google Cloud
- **Math:** R, Time-Series analysis, Regression, Linear Algebra, Nonparametric Statistics, Causal Inference
- **Language:** Fluent in English, Chinese, and French(intermediate)