

Tianjian (Lucas) Gao . Jarvis Consulting

I am a highly-motivated young professional with a passion for software development and finance. I hold a master's degree in AI and Natural Language Processing from the University of Montreal and a double bachelor's degree in Computer Science and French Studies from Penn State University. Professionally, I've worked as a C# and SQL backend developer at a leading FinTech company and completed three internships in backend development and data science. In my free time, I develop chatbots, LLM applications, and am currently working on a mobile development project. I'm proficient in Java and SQL, with a solid grasp of the Software Development Life Cycle, Data Structures, Cloud technologies, and Core Algorithms. A quick learner with a growth mindset, I'm eager to tackle challenges in the ever-evolving tech industry. I've also developed a keen interest in FinTech and aspire to explore trading and quantitative finance. On a lighter note, I'm a classical pianist who dabbles in jazz and have maintained a 1500-day streak on Duolingo.

Skills

Proficient: Java, C#/.Net, Linux/Bash, RDBMS/SQL, Agile/Scrum, Git, REST APIs, Python, Scikit-learn, PyTorch

Competent: C++, HTML/CSS/JavaScript, Maven, Sprint Boot, AWS, GCP

Familiar: Flutter, React, Jenkins, NodeJS, Angular

Jarvis Projects

Project source code: https://github.com/jarviscanada/jarvis_data_eng_tianjiangao

Cluster Monitor [GitHub]: To-do. Suspendisse a tincidunt odio. Suspendisse posuere luctus aliquet. Quisque magna tellus, tempor vitae arcu sed, volutpat scelerisque lacus. Aliquam varius pulvinar dapibus. Ut a tincidunt sem. Aenean sollicitudin fringilla erat ut imperdiet. Phasellus fermentum, enim vitae laoreet elementum, eros nisl hendrerit lorem.

Core Java Apps [GitHub]:

- Twitter App: Curabitur laoreet tristique leo, eget suscipit nisi. Sed in sodales ex. Maecenas vitae tincidunt dui, et eleifend quam.
- JDBC App: Curabitur laoreet tristique leo, eget suscipit nisi. Sed in sodales ex. Maecenas vitae tincidunt dui, et eleifend quam.
- Grep App: Curabitur laoreet tristique leo, eget suscipit nisi. Sed in sodales ex. Maecenas vitae tincidunt dui, et eleifend quam.

Springboot App [GitHub]: Not Started

Python Data Analytics [GitHub]: Not Started

Hadoop [GitHub]: Not Started

Spark [GitHub]: Not Started

Cloud/DevOps [GitHub]: Not Started

Highlighted Projects

PDF and YouTube summarizers: LLM applications using LangChain and RAG. Leveraged Chroma and Weaviate vector databases for efficient text storage and indexing. Compared Faiss, ScaNN, and Annoy similarity-search algorithms. Applied prompt engineering techniques such as in-context learning, few-shot learning and chain-of-thoughts for better reasoning performance.

French Restaurant Reservation Agent (Chatbot): Created a chatbot for initiating and managing restaurant reservations using Rasa. Defined user intents, actions, slots, and responses. Designed conversation flows with ManyChat, and deployed the application using Docker and ngrok. Optimization of the chatbot with Rasa X (CI/CD) and integration with Facebook Messenger. Currently reimplementing the bot on Google Dialogflow CX.

Deep Learning from Scratch [GitHub]: Implemented deep learning models and components, including CNN, RNN, GRU, VAE, GAN, Transformer and GPT-2, as well as algorithms such as KL divergence, attention mechanism, and activation functions, using Python 3 and Numpy.

RPG Game Strategy Optimization [GitHub]: Created a text-based RPG game using Python 3. Implemented complex dynamic programming algorithms such as forward recursion, approximate value iteration, and Q-learning to simulate the optimal level-up strategies. Optimized the algorithms using multi-threading.

JavaScript and Java Web Development: Imitated Apple's dynamic scrolling mechanism with JavaScript Scroll Magic and worked on the Odin Project to create a web service for user login. Created an application for nurse scheduling using the Java backend with Maven, Spring Boot, and MongoDB.

Brownian Motion Simulation for Quantitative Finance: Explored the stochastic process and quadratic variation to approximate Brownian motion. Loaded stock data from Yahoo Finance. Implemented Monte Carlo simulations for financial modeling using SciPy and Pandas.

Professional Experiences

Software Developer, Jarvis (2024-present): Donec mattis sed justo et sagittis. Vestibulum lacinia nulla ipsum. Curabitur imperdiet nibh vitae leo lacinia laoreet. Nullam accumsan, lectus ut maximus ultricies, augue justo egestas mi, vel bibendum felis.

Lead NLP Developer, Mobile App for Speech Disorders, Vocality (2024-present): Creating text prediction models and autocomplete features to help ALS patients communicate better. Developing on-device large language models (LLM) using tfLite-flutter. Treating and storing user conversation using langchain-dart and OpenAI API. Developing traditional autocomplete algorithms such as Trie and Markov-chains. (TBC)

Backend Developer, Wealth Management Platform, FNZ Group (2023-2024): Created SQL tables and views in MS SQL Server and optimized C# backend for a \$1.5T AUM wealth management platform. Developed and processed REST APIs using parameter binding in .NET and tested server response using Insomnia/Postman.

Backend Developer Intern, Senior-Care Chatbot, Innovention (2023-2023): Developed a natural language understanding (NLU) module using StringBuilder, LINQ, and Stanford NLP to extract entities and actions from user input for a custom chatbot platform. Built a knowledge graph using Neo4j, improving "common sense" question answering by 100%. Experimented with retrieval-augmented generation (RAG) using Chroma and LangChain for indexing user info and knowledge.

Data Scientist Intern, Data-driven Analytics, International Air and Transportation Association (2021-2022): Leveraged keyword modeling (AutoPhrase), topic modeling (LDA), unsupervised clustering, and taxonomy generation to extract over 100 new aviation incident topics from 2 million aviation incident reports, helping improve aviation safety. Implemented algorithms from research, ported code from Python 2 to Python 3 and edited shell scripts for model training. Worked within a cross-functional team to share classification models, word embeddings, and taxonomies with member airlines, reducing time and cost for data analytics.

Data Scientist Intern, Data-driven Analytics, International Air and Transportation Association (2020-2021): Used machine learning models for text analysis and integrated them into the IATA dashboard. Preprocessed 2 million multi-lingual aviation reports using spaCy and Gensim. Detected text languages using TextBlob. Trained machine learning models using Scikit-learn, as well as BERT and T5 language models to classify reports into a multi-level taxonomy using PyTorch, facilitating manual classification. Analyzed the aviation reports using Pandas, spaCy, Matplotlib, and TensorBoard. Communicated methodologies and complex data findings effectively with stakeholders.

Education

Université de Montréal (2019-2022), M.Sc. Computer Science, MILA/RALI-DIRO - Full Tuition Exemption Scholarship (\$24 000) - Scholarship of Excellence (\$5 700) - Excellent Thesis Award - GPA: 3.83/4.3

Penn State University (2015-2019), B.Sc. Computer Science & French Studies (double major), Electrical Engineering and Computer Engineering & School of Liberal Arts - Semester Abroad Grant at University of Montpellier (\$ 1 500) - Dean's List 2016, 2017 - Advanced Vehicle Club (ADAS) | Robotic Club (Arduino) | French Club

Miscellaneous

- AWS Certified Cloud Practitioner
- AWS Certified Machine Learning – Specialty
- DeepLearning.AI Generative AI with Large Language Models
- IVADO Chatbot Creation with Rasa and Docker

- IVADO Knowledge Graph Development with Neo4j
- FreeCodeCamp Responsive Web Design (HTML, CSS, Flexbox, CSS Grid)
- 7-year yoga practitioner. I follow Tim Senesi on YouTube
- 5-year hiker. My favorite trails are Mont Orford and Mont Sutton
- Reader. Currently reading Les Misérables, Neuromancer, and The Tommyknockers
- 15-year pianist. Music festival frequenter. Audiophile (HD600 and K612 Pro)
- Volunteer, Penn State Thon for children cancer prevention
- Language learner proficient in English, French, Mandarin Chinese, and Japanese. I have a 1500 day streak on Duolingo
- Traveller. China, United States, France, Spain, Germany, UK, Japan...