# Cheting (Dakota) Meng

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## Education

**Georgia Institute of Technology** Atlanta, GA
Master of Science in Computational Science and Engineering *(GPA: 3.8)* Aug 2022 – May 2025

*Relevant Coursework: Computational Data Analysis (ML), Data Structure & Algorithms, Data Visualization & Analytics (Big data), Computer Vision, Database Systems, NLP, Deep Learning, Time Series Analysis, Modeling & Simulation*

## Skills

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| **Programming Languages:** | Python, SQL, C++, R, Julia, JavaScript, CSS, HTML |
| **Libraries & Frameworks:** | PyTorch, TensorFlow, Keras, Scikit-learn, XGboost, Statsmodels, Langchain, HuggingFace, Transformers, OpenCV, NLTK, Spacy, Scipy, Numpy, Pandas, Matplotlib, Dash, Django, Flask, FastAPI, D3.js |
| **Tools & Concepts:** | AWS, GCP, BigQuery, Snowflake, Jira, MySQL, SQLite, Postgre SQL, Chroma DB, Spark, Databricks, Git, MLflow, Docker, Kubernetes, Linux, Power BI, Tableau |
| **Statistical & Machine Learning** | Regression, Classification, Clustering, Time series analysis, LLM, Deep learning, Anomaly detection, Bayesian inference, Reinforcement learning |

## Work Experience

**Noteworthy AI Inc.** Remote (Atlanta), US
*Machine Learning Research Engineer Intern* Aug 2024 – Dec 2024

- Spearheaded R&D of POC ViT-based image segmentation foundational model training & inference infrastructure to improve performances by 25% with PyTorch on AWS SageMaker CUDA GPU distributed training.
- Speed up dataset curation by 65% and boosted training quality by 15% by developing human-in-the-loop image retrieval automation tool leveraging embedding similarity search, active learning and classification pseudo-labeling.
- Delivered multiple 90+% accuracy & 87+% precision fine-tuned ViT image classifiers to production with Pytorch.
- Architecture customer endpoint for multithreaded image processing pipeline & inference API on AWS SageMaker to process over 400k images monthly with Kubernetes and OpenCV.

**Georgia Institute of Technology** Atlanta, GA
*Graduate Research Assistant* Aug 2022 – Present

- Engineering a 300B-token financial LLM dataset with logical taxonomy to enhance pre-training and benchmarking for finance LLM, validating on 70B-parameter SOTA models for NeurIPS submission.
- Developed custom LLM application for disputes & claims analysis to enhance DOT legal intelligence based on 5k+ pages of contracts leveraging text mining and NER with NTLK, and few-shot learning with OpenAI API and LangChain.
- Publishing NSF journal paper on data-driven decision making by leveraging A/B testing experiment with data mining (Rule mining & PCA), Clustering and statistical inference (ANOVA) in Python and R.
- Mitigated GDOT labor shortage by 17% through boosted workforce insights on Power BI labor statistics dashboard.

**NEW-TECHEM Co. Ltd.** Taipei, Taiwan
*Data Scientist* Jun 2021 – Dec 2021

- Increased quarterly order volume by 20+% with machine learning in sales prediction (Regressions & neural network) and customer churn analysis (gradient boosted decision trees & KNN) in Python Scikit-learn & XGBoost.
- Sped up company data processing by 60% on 200GB+ data by developing ETL pipelines with AWS (S3, Lambda, Redshift), SQL, Spark and Python.
- Enhanced company sales segmentation and targeting efficiency by 30% with KPI dashboards using Power BI and Python and led presentations to non-technical stakeholders.

## Projects

**GNN Amazon Recommendation System**

- Achieved 0.98 R-squared validation score for product rating predictions by developing a BERT-embedded Graph Neural Network (GNN) with multi-task learning on a 36GB Amazon reviews dataset using PyTorch.
- Achieved recommendation system performance at 91% top-5 accuracy by implementing the GNN-based rating score regression model for Amazon product suggestions.

**Healthcare NLP Web Application**

- Achieved 82% top-5 accuracy in predicting vaccination adverse effects by leveraging NLP keyword extraction (NLTK & YAKE!) on 5GB+ VAERS dataset and applying neural network classifier in PyTorch.
- Delivered 92% user satisfaction rate by developing user-friendly webpage using Flask, HTML, CSS, and JavaScript.

**PalmVerse: Computer Vision Sign Language Translator** @ *GT 2024 Hacklytics Hackathon*

- Achieved 90% classification accuracy for hand sign alphabets by integrating OpenCV hand landmark tracker with a custom CNN-based attention model in TensorFlow.
- Developed sign language live translation Python Flask web app powered by custom PalmVerse model.

**Pokemon VAE Image Generation**

- Developed CLIP-encoder-based VAE from scratch in PyTorch trained on 17k+ dataset to enable text-to-image generation, achieving Fréchet Inception Distance (FID) of 15.

**Chatbot API: LLM Quantized Finetuning & RAG**

- Developed a GPT-neoX 20B model with RAG capabilities efficiently fine-tuned on arxiv papers using bitsandbytes quantization and QLoRa (0.08% trainable parameters) in PyTorch and HuggingFace.
- Accumulated 250+ weekly API prompts with model deployed through FastAPI on Ngrok.

**LLM Product Introduction Chatbot** ***[Freelance work @ New-Techem]***

- Prompted x50k+ USD$ orders and 1000+ weekly client usage during industry trade expo with fine-tuned Llama 3-70B plus RAG chatbot web app enabled by Langchain vector database (chroma) on Gradio and Ngrok.

**Large Language Model Evaluation Tool**

*-- LLM efficient evaluation through Bayesian Optimization*

- Reduced LLM evaluation time by ~30% and computation cost by sampling optimal evaluation query/prompt from corpus database through Bayesian Optimization and dense passage retrieval.

**Stock Price Time Series Forecasting**

- Predicted stock prices time series at 0.88 R2 score with Generalized Additive Model and ARMA models (ARIMA & ARIMA-GARCH) in R, optimized model by tuning hyperparameter and formed full statistics reports.

**Course Registration Database Management System**

- Developed course registration database and sped up query response time by 50% with an ER-model on over 10k entries using PostgreSQL relational schema, allowing searching and registration by student Id and course number.

**Credit Card Fraud Detection**

- Detected credit fraud at 99% validation accuracy with pipelined machine learning model data processing, training and testing on 5 different algorithms (SVM, Random Forest, MLP, etc.) in Databricks with Pyspark.

**Earthquake Displacement Prediction**

- Performed data cleansing, EDA and feature engineering on 15 years of sensor data in Python Pandas.
- Achieved 0.24 MSE in predicting displacement (meters) by leveraging forward feature selection with multivariate Lasso Regression & Gaussian mixture model and detected structural defects at 88% accuracy with SVM.

**Vision Transformer Lie Detector**

- Achieved 69% video lie detection accuracy by developing ViViT with optical flow intensity sampling in PyTorch.
- Enabled explainable AI by extracting key frames with the highest attention scores, then applied facial recognition with OpenCV and sentiment analysis with CNN model in Keras and Tensorflow.

**Image Semantic Segmentation**

- Achieved 84% semantic segmentation validation accuracy by leveraging fine-tuning self-built ResNet50 model with pretrained weights on the Camvid dataset (700+ images, 11 classes) and data augmentation.

**Traffic Inundation Modeling**

- Provided traffic insight in best route selection in inundations by developing an agent-based numeric simulation model of the road network system of Virginia Beach, VA.
- Achieved 6%-time difference with simulated regular and inundation traffic compared to SOTA software by leveraging population density estimation, Dijkstra's Algorithm and self-defined speed-congestion decay function.

## Certificates

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| AWS Certified Cloud Practitioner | Tensorflow Developer Certificate |
| IBM Data Science Specialization | IBM Containers with Docker & Kubernetes |