YUJIA ZHANG, PH.D.

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SUMMARY

Machine learning researcher with 7+ years of experience in developing and deploying ML models, specializing in knowledge graphs and language models. Skilled with 5+ in leveraging deep learning frameworks (PyTorch, TensorFlow) and cloud platforms (AWS, Azure) to drive promising impact.

EDUCATION

Ph.D. of Computer Engineering, GPA 4/4, University of Alberta — Sept. 2019 - Nov. 2024
Master of Computer Engineering, GPA 4/4, Chonbuk National University — Aug. 2016 - Aug. 2018
Bachelor of Engineering, GPA 3.7/4, Shanghai University of Engineering Science — Sept. 2011 - July 2015

EXPERIENCE

Data Analyst — May 2019 - Oct 2019
Nanoprecise Sci Corp — *Edmonton, CA*

- Implemented **exploratory data analysis (EDA)** to analyze sensor signal data, enabling predictive maintenance for sensors with a **95% accuracy rate** in failure detection by **Random Forest** Model.
- Migrated and optimized firmware code to Python, improving the efficiency and scalability of the data processing pipeline.
- Conducted **comprehensive sensor data analysis** to identify patterns and anomalies, providing actionable insights to prevent equipment failures.
- Created dynamic **visualization dashboards** to communicate complex analytical results effectively, presenting findings to both technical and non-technical stakeholders, including customers.

R&D Product Engineer — May 2015 - July 2016
YUNGTAY ELEVATOR EQUIPMENT (CHINA) CO., LTD. — *Shanghai, China*

- Led the **data collection and quality assurance process** for elevator measurement data, ensuring compliance with strict industry standards and performance benchmarks.
- Conducted **statistical analysis** and implemented quality control techniques to verify that product measurements met design and regulatory requirements.
- Authored detailed **technical reports** summarizing analysis results, providing actionable recommendations to improve product quality and reliability.
- Collaborated with cross-functional teams, including design and manufacturing, to address discrepancies and optimize product performance based on data insights.

PROJECTS

Knowledge Graphs Construction via Large Language Models (LLM). — June 2023 - May 2024
University of Alberta — *Edmonton, CA*

- **Problem:** To develop an efficient system for constructing KGs from unstructured text by fine-tuning LLMs.
- **Team Collaboration:** Collaborated closely with team members to align project goals, share insights, and set a timeline to follow.
- **Model Deployment:** Designed and implemented a saclable LLM deployment pipeline using **HuggingFace Transformers**. Optimized model inference for **Llama3 and Mistral** through Autotrain, ensuring a professional setup.
- **Scalable Training:** Developed scalable fine-tuning workflows for LLM, achieving a **30% reduction in training time** while handling diverse datasets such as WebNLG and SKE.

- **Key Findings: smaller LLMs of 7b parameters** can **achieve or exceed** the performance of **big LLMs like GPT-4** in specific tasks such as triple extraction.

Hierarchical Analysis for Knowledge Graphs (KGs). May 2020 - Dec. 2023
University of Alberta *Edmonton, CA*

- **Problem:** To develop a generative model for knowledge graphs.
- **Model Development:** Developed a **non-parametric hierarchical generative model** for KGs, utilizing probabilistic topic modeling techniques to achieve **structured clustering** without preset assumptions.
- **Inference Optimization:** Implemented an efficient **Gibbs sampling** method for scalable inference in Python, enhancing model performance and processing speed.
- **Evaluation:** Conducted **quantitative and qualitative evaluations** on standard datasets, demonstrating comparable performance to established hierarchical clustering methods.
- **Publications:** Two papers based on this work have been published.

Object Detection and Tracking. Aug. 2016 - Aug. 2018
Chonbuk National University *Jeonju, South Korea*

- **Problem Solving:** Identified key challenges in existing models and developed innovative solutions, resulting in significant improvements in tracking accuracy and robustness.
- **Algorithm Research:** Investigated advanced object tracking and recognition techniques using **Siamese networks, LSTM, CNN, and RNN** algorithms implemented in Python with TensorFlow.
- **Performance Enhancement:** Optimized model architectures and training procedures, achieving an increase in **mean Average Precision (mAP)** on standard benchmark datasets.
- **Publication:** Authored multiple research papers detailing novel approaches and empirical results, published in peer-reviewed conferences and journals.

TECHINICAL SKILLS

Database:	SQL, MySQL, NoSQL, MongoDB, Neo4j
Deep Learning Frameworks:	Tensorflow, Pytorch, Keras, Scikit-learn
Development Tools:	Git, Docker, Jupyter
ML Operations:	Model Deployment, Inference Optimization
Programming Languages:	Python, Matlab, Java, C++
Visualization:	Matplotlib, Seaborn, Tableau
Cloud Services:	AWS, Azure, Google AI Platform

EXTRA-CURRICULAR ACTIVITIES

- Volunteer for the energy Adventure in TELUS World of Science May 2024
- TA in ECE 493 Software Systems Design Project Jan. 2024 - Apr. 2024
- TA in ECE 627 Intelligent Web Jan. 2023 - Apr. 2023
- TA in ECE 447 Data Analysis and Machine Learning for Engineers Jan. 2023 - Apr. 2023
- TA in ENCMP 100 Computer Programming for Engineers Jan. 2021 - Apr. 2021
- ICTAI 2022 Conference Publicity Chair Oct 2022

PUBLICATIONS

- **PhD Thesis Paper:** Constructing Knowledge Graphs with Language Models and Learning Hierarchies from Graphs using Probabilistic Topic Modeling, *Sept. 2024*

- **Journal Submission:** Construction of Topic Hierarchy with Subtree Representation for Knowledge Graphs, submitted to *Information Representation and Management Journal* *Aug. 2024*
- Fine-tuning Language Models for Triple Extraction with Data Augmentation, published at *Knowledge Graphs and Large Language Models (KaLLM)* Workshop, 62nd Annual Meeting of the Association for Computational Linguistics (ACL 2024) *Aug. 2024*
- Hierarchical Topic Models for Knowledge Graphs, *19th European Semantic Web Conference (ESWC 2022), Hersonissos, Greece* *June 2022*
- Robust Object Tracking with Convolutional Gated Recurrent Networks, *International Symposium on Information Technology Convergence (ISITC 2017)*, Shijiazhuang, China *May 2017*
- Deep Residual Convolutional Network for Natural Image Denoising and Brightness Enhancement, *2018 International Conference on Platform Technology and Service (PlatCon-18)*, Jeju, Korea *May 2018*
- Object Tracking via Spatial-Temporal Learning Combined Correlation Filter, *Smart Media 2018*, Seoul, Korea *Feb. 2018*
- **Master Thesis Paper:** Efficient Correlation Matching-Based Real-Time Object Tracking with Spatiotemporal Information, *June 2018*

AWARDS

- J Gordin Kaplan Graduate Student Award, University of Alberta Aug 2024
- Brain Korea 21 Scholarship Aug 2017
- BECKHOFF Scholarship by SUES, Beckhoff Automation Co., Ltd. Bi Fu automation equipment trading (Shanghai) Co., Ltd. July 2014