Yu Zhang

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SHORT BIOGRAPHY

Yu Zhang is a senior artificial intelligence algorithm engineer at State Power Investment Corporation Digital Technology Co., Ltd, passionate about applying deep learning, device fault diagnosis, natural language processing, knowledge graphs, and machine learning technologies to enhance the intelligence and operational convenience of traditional systems and improve the quality and efficiency of new energy power plants. Prior to this, he had two working experiences, served as the natural language processing algorithm engineer in the Internet industry, and led several team members to develop algorithms.

From Apr. 2017 to present, Zhang won 1 provincial and ministerial level award (Second Prize of China Safety Production Association), 3 industry level awards, and 2 enterprise level awards based on the developed AI application systems during work. Additionally, he has filed more than 10 patents in China, reflecting a strong commitment to innovation and practical applications of research.

From 2010 to 2017, Zhang studied at the Department of Mechanical and Electronic Engineering at Chongqing University of Posts and Telecommunications, where he recieved his bachelor and master degrees. During this period, he served as the project leader for two municipal level scientific research projects and published six research articles in prestigious international journals and conferences such as Acta Automation Sina and MECH SYST SIGNAL PR. In 2015, he won the first prize in the National Graduate Mathematical Modeling Competition and represented the school to study and exchange at Beijing Jiaotong University.

WORK EXPERIENCE

State Power Investment Corporation Digital Technology Co., Ltd. (As a **AI Technology Manager**) *Jul. 2023 - Present*

Research on Testing, Analysis and Evaluation Model and Data Standardization for Improving Quality and Efficiency of Existing Power Stations

Project Background: Most photovoltaic power stations are under pressure to improve quality and efficiency with frequent equipment failures, and urgently need to identify and promptly address low efficiency power generation issues.

Project Responsibilities:

- Proposed a solution for improving quality and efficiency based on data accumulation of company.
- Led algorithm development, involving data standardization and governance, inefficient identification of photovoltaic strings, knowledge base and intelligent recommendations, evaluation of equipment health status, prediction of photovoltaic string power generation and calculation of power loss, as well as quantitative evaluation of power generation capacity.
- Provided algorithm support based on AI service platform.

Project Achievements:

- The algorithms are planned to be promoted and applied in over 1000 photovoltaic power plants within the group, with an expected increase of 10% in power generation for photovoltaic power plants.

State Power Investment Corporation Digital Technology Co., Ltd. (As a **AI Algorithm Engineer**) *Jul. 2021 - Jun. 2023*

Research on the Construction and Application of Artificial Intelligence Service Platform for Photovoltaic Power Stations

Project Background: The construction of independent AI projects in smart energy scenarios led to a lack of knowledge sharing, repetitive construction of AI services, and the inability to quickly deploy models and maintain efficient operations.

Project Responsibilities:

- Conducted requirement analysis and writed feasibility study report in the early stage as the project leader.
- Prepared project proposal, developed project cost budget, and recruited required personnel.
- Coordinated the completion of software UI design, function design, and software specification manual during design phase.
- Coordinated the development of AI service platform, and participated in the development of algorithm encapsulation and task scheduling modules.

- Responsible for the application and deployment of AI services during the software delivery phase, and ultimately compled the writing of project completion materials.

Project Achievements:

- Completed 3 projects and launched applications in the first year of project operation, increasing revenue by 1 million yuan. In the second year of operation, 12 projects had been put into application, with an revenue of 2.95 million yuan.

Chongqing Financial Assets Exchange, China Ping An Group. (As a **AI Algorithm Engineer**) *Jul. 2020 - Jun. 2021*

Construction of Luyipai Special Asset Trading Platform

Project Background: Luyipai is an asset trading platform, sunch as foreclosed houses, jewelry, etc. The low efficiency of manual pricing in property valuation led to difficulties in debt transactions and affected the asset disposal cycle.

Project Responsibilities:

- Led project development, formulated work plans, organized personnel, arranged division of labor.
- Participated in the research and development of core modules of algorithms.
  - Completed property valuation tasks based on the combination of the market valuation strategies and decision tree model.
  - Achieved precisely matching between the funding and asset parties based on user profiles analysis and user rating method.
  - Automatically generated a PDF version of the debt asset analysis report based on data mining technology.

Project Achievements:

- Achieved property valuation in major cities across the country, with an average deviation controlled within 7%.

Chongqing Financial Assets Exchange, China Ping An Group. (As a **NLP Algorithm Engineer**) *Aug. 2018 - Jun. 2020*

Smart Finance Project

Project Background: Facing difficulties in accurately searching for financial policy documents and relevant contents in policy documents for national finance department personnel, the policy search system was considered to build and upgrade.

Project Responsibilities:

- Developed a Financial Intelligence Interconnection System (FIIS), mainly responsible for product design ideas driven by artificial intelligence technology and knowledge graph.
- Led the planning and division of labor of algorithm modules, and participated in core algorithm development, involving fiscal policy crawling, fiscal knowledge graph construction, policy search engine construction, relevant policy recommendations, and intelligent question answering(QA) of fiscal indicators.

Project Achievements:

- Developed and applied FIIS to a certain finance bureau to solve the problems of difficult policy search and low efficiency in policy content query.

Chongqing Zhubajie Network Co., Ltd. (As a **NLP Algorithm Engineer**) *Apr. 2017 - Jul. 2018*

User Intention Recognition and Service Transaction Matching on Zhubajie Website

Project Background: Facing inaccurate user intention recognition, mismatched user demands, failed transactions between service providers and users in Elasticsearch system of Zhubajie website, resulting in loss of user traffic and reduced revenue.

Project Responsibilities:

- Pioneered service transaction knowledge graph, enterprise knowledge graph, and regional knowledge graph in vertical domain for the Zhubajie website.
- Developed algorithms about user intention recognition, query construction, service providers recommendation, and user task matching based on knowledge graphs for Elasticsearch system.

Project Achievements:

- Improved the accuracy of user intention recognition and effectively enhanced the success rate of transactions between user needs and service providers.
- Innovatively utilized named entity recognition methods to achieve service drainage in the field of intellectual property, increased monthly revenue by nearly one million.

EDUCATION

Chongqing University of Posts and Telecommunications *Sep. 2014 - Jun. 2017*

M.E. Mechatronic Engineering. Graduation GPA: 3.55 (Top 1%)

Chongqing University of Posts and Telecommunications *Sep. 2010 - Jun. 2014*

B.E. Mechanical Design, Manufacturing and Automation. Graduation GPA: 3.22 (Top 5%)

PROJECTS

The Twelfth National Graduate Mathematical Modeling Contest of the Zhongguancun Youth Cup *Jul. 2015 - Sep. 2015*

Project Description: As the team leader, led the team to complete wireless channel "fingerprint" feature modeling, channel scene recognition, channel area division, and identity verification.

Personal Responsibility: Establised model and simulation by matalb.

The Seventh KeHui Cup Inovation & Entrepreneurship Competition for Postgraduate of ChongQing (Yu Jiao Research [2015] No. 13) *Dec. 2015 - Nov. 2016*

Project Description: Built a cloud platform based on Vehicle fault diagnosis methods and service as the project leader.

- Acquired data by monitoring the behavior of the driver and the vehicle state.
- Constructed fault diagnosis function that could be upgraded to online diagnosis by considering the potential failure risk of the driver due to improper operation combined with the internet technology.
- Provided users with timely information, reminders, electronic drive, driving emergency plan and emergency rescue service by data analysis to make the decisions with making full use of big data resourses based on cloud platform.
- Completed the development of the APP service platform.

Personal Responsibility: Completed the overall functional architecture design of the cloud service platform, and conducted data analysis and algorithm development.

Chongqing Graduate Research Innovation Project (Grant No. CYS16168) *Jan. 2016 - Apr. 2017*

Project Description: Research on the methods of fault diagnosis for automobile engine as the project leader.

- Designed state observer to estimate the acceleration of the crankshaft.
- Misfire Detection using artificial neural network.
- Research on the cause of misfire with the relation of EGR system by exploring EGR valve.

Personal Responsibility: Established vehicle engine dynamic model and the algorithms of misfire detection and analyzed the cause of the misfire fault diagnosis.

RESEARCH PUBLICATION

1. Taixiong Zheng, **Yu Zhang,** Yongfu Li. Misfire Fault Diagnosis of Automobile Engine: A Review[J]. Acta Automatica Sinica, 2017, 43(4):497-515

2. Taixiong Zheng, **Yu Zhang**, Yongfu Li, Lichen Shi. Real-time combustion torque estimation and dynamic misfire fault diagnosis in gasoline engine[J]. Mechanical Systems and Signal Processing, 2019, 126(JUL.1):521-535

3. **Yu Zhang**, Tonglin Zhou, Taixiong Zheng, et al. Misfire detection based on switched state observer of hybrid system in internal combustion engine[C]//In Proceedings of International Conference on Advanced Manufacturing Technology and Materials Engineering, Guangzhou, China,2016

4. **Yu Zhang**, Rui Tan, Taixiong Zheng, et al. Real-time crankshaft angular speed tracking and indicated torque estimation via optimized Luenberger sliding mode observer[C]//In Proceedings of the International Conference on Advances in Energy Resources and Environment, Engineering, Guangzhou, China, 2016

5. Rui Tan, **Yu Zhang**, Taixiong Zheng, et al. Valve clearance fault diagnosis of internal combustion engine based on wavelet packet and k-nearest neighbors[C]//In Proceedings of International Conference on Mechanical, Control and Computer Engineering, Guangzhou, China,2016

6. Weiming Han, Yanjun Wang, Taixiong Zheng, Tongling Zhou, **Yu Zhang**, Rui Tan. Control of a selective catalytic reduction system based on NARMA-L2 model[J]. Iop Conference, 2017, 59:012036

AWARDS

The Research and Application of Key Technologies for Fault Diagnosis of Photovoltaic Modules Won the Fourth Safety Science and Technology Progress Award. (**Second Prize, China Association of Work Safety**)	*Dec. 2023*
The Application of Artificial Intelligence Service Platform Based on New Power System was Included in the Typical Cases of the 2022 New Power System Innovation Case Exchange Conference. (**China Energy Research Association Electric Energy Technology Professional Committee**)	*May. 2023*
The Research on the Diagnosis Method of Automobile Engine Misfire Fault Won the Excellent Master's Thesis Award. (**CQUPT**)	*Jun. 2017*
The Twelfth National Graduate Mathematical Modeling Contest of the Zhongguancun Youth Cup. (**First Prize, China**)	*Dec. 2015*
Excellent Graduate Student & Advanced Indivadual of Young Volunteer. (**CQUPT**)	*Dec. 2015*
National Encouragement Scholarship & Enterprise & Academic Scholarship. (**Total: Five Times, CQUPT**)	*2011-2015*
Excellent Student Cadre & Merit Student. (**CQUPT**)	*2012-2013*
The Seventh KeHui Cup Inovation & Entrepreneurship Competition for Postgraduate. (**Second Prize, Chongqing**)	*Dec. 2012*

SKILLS AND INTERESTS

Interests	**Natural Language Processing (NLP):** Word Vector Model, Sequence Annotation (e.g. HMM, MEMM, CRF, LSTM), Text Classification, ANSJ Word Segmentation, Knowledge Graph (KG), KG Query Q&A **Text Mining:** TF-IDF, TextRank, K-Means clustering, Latent Dirichlet Allocation **Machine Learning:** Naive Bayes, Logistic Regression, Decision Trees (e.g. GBDT, XGBoost, LightGBM), Principal Component Analysis, Linear Discriminant Analysis, Support Vector Machine, Neural Network **Deep Learning:** CNN, RNN, LSTM, Attention Mechanism, Transformer, Bert **Programming Language & Tool:** Python, Java, C, C++, Mysql, SPARQL (RDF), Cypher (Neo4j) **Modeling and Simulation:** Matlab, Gtpower, LMS Amesim, Lingo, SPSS
Certification	CET-6 & CCT-2 & Driving License of the People's Republic of China(C1)