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RESEARCH OVERVIEW

I am currently a Senior Algorithm Engineer in the Alibaba Cloud, Alibaba Group. I received the Ph.D degree from Zhejiang University in 2021. My research interest mainly lies in Machine Learning, Reinforcement Learning and Data Mining.

EXPERIENCE

•Alibaba Cloud, Alibaba Group   Hangzhou, China
Senior Algorithm Engineer   2021/04-present

- **Led the R&D team (a team of 5 engineers and researchers) for the decision-making intelligent agent project. Held roles as a product manager, technical architect, and machine learning model researcher.** Responsible for defining problems and designing the decision-making intelligent agent product; proposing solutions and collaborating with colleagues to design the technical architecture; researching and proposing new state-of-the-art LLM-guided Reinforcement Learning methods for addressing challenges.
- **Explored cutting-edge methods of LLM-based agents and human alignment techniques such as RLHF (Reinforcement Learning from Human Feedback) and DPO (Direct Preference Optimization).** Collaborated with fellow researchers to develop novel LLM-based agents addressing real-world problems, utilizing human alignment methods to ensure the agents' outputs met human expectations.
- **Participated in the Digital Twin project, collaborating with fellow engineers to develop camera simulation and traffic simulation modules** Responsible for developing core algorithms such as route planning and camera field of view simulation. Proposed a fast field of view simulation algorithm based on ray casting and polar coordinate transformation.
- **Supervising fellow Engineers and Research Interns.**
- **Academic Commitments. Published three peer-reviewed papers in ECCV, IEEE TIP, and IJMLC.** Collaborated with fellow research interns to publish academic research in peer-reviewed conferences and journals. Served as a Program Committee (PC) member for conferences such as ECCV, AAAI, IJCAI, and others.

•DAMO Academy, Alibaba Group   Hangzhou, China
Research Intern   2018/01-2021/04

- **Developed research projects and methodologies. Published eight peer-reviewed papers in AAAI, IJCAI, IEEE TKDE, IEEE TIP and so on.** Collaborated with fellow students to design methodologies, create training and testing datasets, design and conduct experiments, collect and analyze experimental results, and summarize findings into academic outcomes.
- **Participated in projects, proposed solutions for encountered technical challenges. Filed eight national invention patents.** Designed, developed, and deployed machine learning models in real-world applications to solve encountered technical problems.
- **Developed a urban traffic forecasting module.** Collaborated with fellow researchers to propose a graph neural network-based traffic forecasting method, achieving state-of-the-art performance in several public benchmarks.
- **Explored cutting-edge areas of Artificial Intelligence and Machine Learning.** Presented our works at conferences IJCAI-20 and IJCAI-21. Conducted literature reviews and delivered topic-specific presentations within the company.
- **Served as a Program Committee (PC) member and reviewer for conferences and journals.** Such as CVPR, AAAI, IJCAI, IEEE TIP, Neurocomputing and others.

EDUCATION

•Ph.D. in Computer Science and Technology   2017/09-2021/03
Zhejiang University, China   Advisors: Prof. Deng Cai, Prof Xiaofei, He
Research Area: Machine Learning, Reinforcement Learning, Computer Vision
Thesis: Stable Learning for Non-I.I.D Data and its Application in Traffic Domain

•**M.S.c** in Information System 2015/09-2016/12
Surrey University, UK Advisors: Prof. H Lilian Tang
Research Area: Machine Learning, Convolutional Neural Networks, Data Mining
Thesis: CNN-based Mycobacterium Cells Segmentation for Time-lapse Images

•**B.S.** in Communication Engineering 2011/09-2015/06
Jilin University, China

ACHIEVEMENTS

•**Outstanding Intern** Alibaba Group *2018-2019, 2021*
•**Outstanding Postgraduate Student** Zhejiang University *2019-2020*

SKILLS AND INTERESTS

•**Technical Skills:**
Proficient in Python, Pytorch, Pandas, scikit-learn, Latex, Linux system and Microsoft Office.
Extensive experience in distributed computing with Jenkins, Kubernetes (K8s), and Docker development.
Experience with common database including MySQL, PostgreSQL.
Experience with common message queue including Rocket MQ, Kafka.

•**Interests:** Quantitative Trading and Game Theory.

PUBLICATIONS

P1 Xiang, Chao, Zhongming Jin, **Zhengxu Yu**, Xian-Sheng Hua, Yao Hu, Wei Qian, Kaili Zhu, Deng Cai, and Xiaofei He. "Optimizing traffic efficiency via a reinforcement learning approach based on time allocation." International Journal of Machine Learning and Cybernetics 14, no. 10 (2023): 3381-3391.

P2 **Zhengxu Yu**, Zhongming Jin, Long Wei, Jianqiang Huang, Deng Cai, Xiaofei He, Xian-Sheng Hua. "Progressive Transfer Learning." IEEE Trans. Image Processing (TIP), vol. 31, pp. 1340-1348, 2022, doi: 10.1109/TIP.2022.3141258.

P3 Peng, Liang, Fei Liu, **Zhengxu Yu**, Senbo Yan, Dan Deng, Zheng Yang, Haifeng Liu, and Deng Cai. "Lidar point cloud guided monocular 3d object detection." ECCV 2022.

P4 Xin Guo*, **Zhengxu Yu*** (*Co-first author), Pengfei Wang, Zhongming Jin, Jianqiang Huang, Deng Cai, Xiaofei He, and Xian-Sheng Hua. "Urban Traffic Light Control via Active Multi-agent Communication and Supply-Demand Modeling," in IEEE Transactions on Knowledge and Data Engineering (2021), doi: 10.1109/TKDE.2021.3130258.

P5 **Zhengxu Yu***, Yilun Zhao* (*Co-first author), Bin Hong, Zhongming Jin, Jianqiang Huang, Deng Cai, Xian-Sheng Hua. "Apparel-invariant Feature Learning for Person Re-identification." IEEE Transactions on Multimedia, doi: 10.1109/TMM.2021.3119133.

P6 Wang, Wenxiao, **Zhengxu Yu**, Cong Fu, Deng Cai, and Xiaofei He. "COP: customized correlation-based Filter level pruning method for deep CNN compression." Neurocomputing 464 (2021): 533-545.

P7 **Zhengxu Yu**, Shuxian Liang, Long Wei, Zhongming Jin, Jianqiang Huang, Deng Cai, Xiaofei He, Xian-Sheng Hua. "MaCAR: Urban Traffic Light Control via Active Multi-agent Communication and Action Rectification." IJCAI-PRICAI'2020 (Acceptance Rate: 12.3% (592/4717)).

P8 Liang Xie, Chao Xiang, **Zhengxu Yu**, Guodong Xu, Zheng Yang, Deng Cai, Xiaofei He. "PI-RCNN: An Efficient Multi-sensor 3D Object Detector with Point-based Attentive Cont-conv Fusion Module." AAAI'2020 (Acceptance rate: 16.2% (1150/7095)).

P9 Long Wei, Zhenyong Wei, Zhongming Jin, **Zhengxu Yu**, Jianqiang Huang, Deng Cai, Xiaofei He, Xian-Sheng Hua. "SIF: Self-Inspirited Feature Learning for Person Re-Identification." IEEE Trans. Image Processing (TIP) 29: 4942-4951 (2020).

P10 **Zhengxu Yu**, Zhongming Jin, Long Wei, Jishun Guo, Jianqiang Huang, Deng Cai, Xiaofei He, Xian-Sheng Hua. "Progressive Transfer Learning for Person Re-identification." IJCAI'2019 (Acceptance rate: 17.9% (850/4752)).

P11 Long Wei*, **Zhengxu Yu*** (*Co-first author), Zhongming Jin, Liang Xie, Jianqiang Huang, Deng Cai, Xiaofei He, Xian-Sheng Hua. "Dual Graph for Traffic Forecasting." IEEE ACCESS (2019).

P12 **Zhengxu Yu**, Pengfei Wang, Junkai Xu, Liang Xie, Zhongming Jin, Jianqiang Huang, Xiaofei He, Deng Cai, Xian-Sheng Hua. "Stable Learning via Causality-based Feature Rectification." arXiv preprint arXiv:2007.15241.