

Junyi Zhu

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Education

- Apr. 2020 – Mar. 2024 📖 **Ph.D., KU Leuven, Leuven, Belgium**
Major in artificial intelligence, advised by Prof. Matthew Blaschko at ESAT-PSI lab.
My research interests include (listed by recency): 1) Contextual comprehension and inference efficiency of language models. 2) Training and inference efficiency of diffusion models. 3) Image and scene reconstruction using implicit neural representation. 4) Security and privacy related issues in AI. 5) Distributed training schemes, such as federated learning.
- Oct. 2015 – Aug. 2019 📖 **M.Sc., Karlsruhe Institute of Technology, Karlsruhe, Germany**
Major in vehicle technology and information technology.
Thesis: *Localization in Aerial Imagery with Grid Maps*
Enhancing autonomous vehicle localization by generating grid maps from georeferenced aerial imagery using Generative Adversarial Network (GAN) and aligning the generated grid maps with real-time point cloud. *(The results of the graduation project were tested on an actual autonomous driving platform.)*
- Oct. 2014 – Jun. 2015 📖 **B.Sc. (Exchange Program), Dresden University of Technology, Dresden, Germany**
Major in Mechanical Design and Automation.
Thesis: *Design and Implementation of Automated Penetration Measuring System.*
Designing and implementing the electrical system and software for an automated penetration measuring system for the purpose of novel agricultural research. *(The results of the graduation project have been deployed in Institute for Natural Product Technology for scientific research work.)*
- Sept. 2011 – Jul. 2014 📖 **B.Sc., Beijing Institute of Technology, Beijing, China**
Major in Mechanical Engineering.

Experience

- Since Apr. 2024 📖 Research associate at ESAT-PSI lab of KU Leuven.
- Since Feb. 2024 📖 External collaboration with Institute for Advanced Algorithms Research, Shanghai.
- Since Oct. 2023 📖 External collaboration with Infinigence-AI.
- Aug. 2023 - Oct. 2023 📖 Visiting PhD student in the NICS-EFC lab at Tsinghua University.
- June 2023 📖 Attended Generative Modeling Summer School (GeMSS).
- July 2022 📖 Attended Machine Learning Summer School (MLSS).
- Since 2021 📖 Reviewer at ICML, NeurIPS, ICLR, CVPR, ICCV, ECCV, TMLR, AISTATS, etc.
- Aug. 2019 - Mar. 2020 📖 Research assistant in MRT institute in Karlsruhe.
- Apr. 2018 - Apr. 2019 📖 Student researcher in FZI research center in Karlsruhe.
- Nov. 2017 - Feb. 2018 📖 Internship at Hella KGaA Hueck & Co for autonomous driving system development.

Research Publications

- 1 ***Zhu, J.**, *Liu, S., Yu, Y., Tang, B., Yan, Y., Li, Z., Xiong, F., Blaschko, M. B. (2024). FastMem: Fast Memorization of Prompt Improves Context Awareness of Large Language Models. arXiv.
- 2 *Liu, E., ***Zhu, J.**, Lin, Z., Ning, X., Blaschko, M. B., Yan, S., Dai, G., Yang, H., Wang, Y. (2024). Efficient Expert Pruning for Sparse Mixture-of-Experts Language Models: Enhancing Performance and Reducing Inference Costs. Under Review, will be uploaded to arXiv soon.
- 3 *Liu, E., ***Zhu, J.**, Lin, Z., Ning, X., Blaschko, M. B., Yekhanin, S., Yan, S., Dai, G., Yang, H., Wang, Y. (2024). Linear Combination of Saved Checkpoints Makes Consistency and Diffusion Models Better. arXiv.
- 4 *Shi, J., ***Zhu, J.**, Pelt, D, Joost, B, Blaschko, M. B. (2024). Implicit Neural Representations for Robust Joint Sparse-View CT Reconstruction. arXiv.

- 5 **Zhu, J.**, Lin, Z., Liu, E., Ning, X., Blaschko, M. B. (2024). Rescaling intermediate features makes trained consistency models perform better. In the second tiny papers track at ICLR (notable).
- 6 **Zhu, J.**, Yao, R., Blaschko, M. B. (2023). Surrogate model extension (SME): A fast and accurate weight update attack on federated learning. In Proceedings of the 40th international conference on machine learning (ICML).
- 7 **Zhu, J.**, Blaschko, M. B. (2023). Improving differentially private SGD via randomly sparsified gradients. Transactions on Machine Learning Research (TMLR).
- 8 ***Zhu, J.**, *Ma, X., Blaschko, M. B. (2023). Confidence-aware personalized federated learning via variational expectation maximization. In IEEE/CVF conference on computer vision and pattern recognition (CVPR).
- 9 *Ma, X., ***Zhu, J.**, Blaschko, M. B. (2022). Tackling personalized federated learning with label concept drift via hierarchical Bayesian modeling. In Workshop on federated learning: Recent advances and new challenges (in conjunction with NeurIPS) (oral).
- 10 **Zhu, J.**, Blaschko, M. B. (2021). R-GAP: Recursive gradient attack on privacy. In International conference on learning representations (ICLR).
- 11 Hu, H., **Zhu, J.**, Wirges, S., Lauer, M. (2019). Localization in aerial imagery with grid maps using locgan. In 2019 IEEE intelligent transportation systems conference (ITSC).
- 12 Kamran, D., **Zhu, J.**, Lauer, M. (2019). Learning path tracking for real car-like mobile robots from simulation. In 2019 european conference on mobile robots (ECMR) (oral).

Skills

Languages  Chinese, English, German.
Programming  Python, PyTorch, Linux, etc.

About Me

Conducting research in the field of AI and using this technology to enhance industry or our daily lives are my greatest passions. I look forward to the day when AGI becomes a reality.

I take great pleasure in reading, with a particular fondness for the history and philosophy of ancient civilizations and the Renaissance, alongside biographies of contemporary figures.

I also enjoy traveling and exploring various locations. One of my ingrained ideas is to visit every corner of the world inhabited by humans, including Antarctica and space stations.

References

Prof. Matthew Blaschko

My PhD advisor,
ESAT-PSI, KU Leuven.

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 matthew.blaschko@esat.kuleuven.be

Prof. Tinne Tuytelaars

Member of my PhD supervisory committee,
ESAT-PSI, KU Leuven.

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