

Zhang Boxuan

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RESEARCH INTEREST

Machine Learning Trustworthy ML, Active Learning
Foundation Models LLMs & VLMs (Reliability, Safety, Human Alignment)

EDUCATION

Wuhan University **Wuhan, CHN**
M.E. in Artificial Intelligence *Sept. 2022 - June 2024*

– Overall GPA: 92.08/100 (**Top 10%**)

Wuhan University **Wuhan, CHN**
B.E. in Computer Science and Technology *Sept. 2018 - June 2022*

– Overall GPA: 3.6/4.0

PUBLICATIONS

(* Indicates Equal Contribution)

○ **What If the Input is Expanded in OOD Detection?**

Boxuan, Zhang*, Jianing Zhu*, Zengmao Wang, Tongliang Liu, Bo Du, and Bo Han
In *Advances in Neural Information Processing Systems (NeurIPS)*, Vancouver, 2024.

○ **Boosting Semi-Supervised Object Detection in Remote Sensing Images with Active Teaching**

Boxuan, Zhang, Zengmao Wang, and Bo Du
In *IEEE Geoscience and Remote Sensing Letters (GRSL)*, 2024.

RESEARCH EXPERIENCE

Department of Computer Science, Purdue University **West Lafayette, USA**
Summer Research Intern, Advisor: Prof. Ruqi Zhang *June. 2024 - Now*

- Research on *Uncertainty Quantification for Large Language Models*.
- Propose to quantify the uncertainties intrinsic to LLMs' generations through a chain-of-thought (CoT) perspective. By breaking down the reasoning process of LLMs into discrete steps, we quantify the inherent uncertainties associated with each step and then aggregate these to form an overall final uncertainty score.
- The paper is being written and will be appeared soon.

TMLR Group, Hong Kong Baptist University **Hong Kong, CHN**
Research Intern, Advisor: Prof. Bo Han *Nov. 2023 - May. 2024*

- Research on *Out-of-Distribution (OOD) Detection for Trustworthy Machine Learning*.
- Propose a novel perspective to employ different common corruptions on the input space to expand the representation dimension for OOD detection. With the expectation among multiple input dimension, our method performs a better ID-OOD separability.
- Submit one paper as co-first author to NeurIPS 2024 and get accepted.

Department of Civil Engineering, Wuhan University **Wuhan, CHN**
Research Intern, Advisor: Prof. Xiaoping Zhang *Aug. 2023 - Oct. 2023*

- Research on *Machine Learning for Tunnel Boring Machines (TBMs) Excavation*.
- Work on rock mass accurate classification based on multi-algorithm cross multi-feature optimization selection and TBM parameter efficient prediction using low-dimensional inputs. This helps TBMs to

perceive geological conditions in advance and study the optimal operational parameters under geological variations.

- Win the third place in The Second China TBM Excavation Parameter Data Sharing and Machine Learning Competition.
- The code is publicly available at: github.com/ZBox1005/TBM-Competition

Sensing IntelliGence and MACHine learning(SIGMA) Lab, Wuhan University **Wuhan, CHN**
Research Assistant, Advisor: Prof. Zengmao Wang and Prof. Bo Du *Nov. 2022 - Aug. 2023*

- Research on *Active Learning for Semi-Supervised Object Detection in Remote Sensing Images*.
- Propose to boost semi-supervised object detection with active teaching (SSOD-AT) in remote sensing images. SSOD-AT can achieve high detection accuracy only with limited labeled samples, which helps to alleviate the dependency on limited labeled images in remote sensing scenarios.
- Submit one paper to IEEE Geoscience and Remote Sensing Letters (GRSL) and get accepted.
- The code is publicly available at: github.com/ZBox1005/SSOD-AT

National Engineering Research Center for Multimedia Software, Wuhan University **Wuhan, CHN**
Undergraduate Research Assistant, Advisor: Prof. Jing Xiao *Jan. 2022 - May 2022*

- Research on *Semantic Segmentation for Open Set Domain Adaptation* (Undergraduate Thesis)
- Propose a feature alignment method using a cross bilateral filter and depth-based warping to help the segmentation model better migrate between open domains (e.g. daytime scene to nighttime scene).
- Defend the undergraduate thesis and get excellent rating.

AWARDS AND HONORS

- **National Third Prize**, The Second TBM Excavation Machine Learning Competition, Oct. 2023.

SELECTED COURSES

- **Graduate**

Machine Learning in Computer Vision (96), Machine Learning (92), Advanced Algorithm Design and Analysis (90), Mathematical Models and Optimization (93)

- **Undergraduate**

Advanced Mathematics(92), Probability Theory and Mathematical Statistics(93), Principles of Compiler(95), Computer Networks(91), Database Systems(93), Multimedia Technology (95)

KEY SKILLS

Programming Python, Pytorch, LaTeX, JavaScript
Languages Chinese, English (IELTS: 7.0)

REFERENCES

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- **Prof. Yong Luo**
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