Wenshuo Wang

202364870251@mail.scut.edu.cn https://vincewangvw.github.io

EDUCATION

South China University of Technology, Guangzhou, China **2023 - Present**

B.Eing, School of Future Technology, Major in Artificial Intelligence

- **GPA:** 3.09/4.0
- **Major Courses:** Python, Machine Learning, Deep Learning, Fluid Mechanics, Heat Transfer, and related subjects

PUBLICATIONS AND PREPRINTS

Breaking Scale Anchoring: Frequency Representation Learning for Accurate High-Resolution Inference from Low-Resolution Training *(preprint)*

Wenshuo Wang, *Fan Zhang*† *(*† *Corresponding Author)*

- When deep learning models perform spatiotemporal forecasting at higher resolutions, they do not exhibit the power-law error decay characteristic of numerical solvers. Instead, their accuracy remains almost unchanged. We regard this long-accepted behavior as a problem, which we term Scale Anchoring.
- We identify the core limitation behind Scale Anchoring as the Nyquist frequency of the training data. Based on this insight, we propose Frequency Representation Learning to induce frequency-domain extrapolation with only minor computational overhead, enabling the model to mitigate this issue.

Pi-CCA: Prompt-Invariant CCA Certificates for Replay-Free Vision–Language Continual Learning *(preprint)*

Jiayu Zhang, Chuangxin Zhao, Ruibo Duan, Canran Xiao, Wenyi Mo, Haoyu Gao, ***Wenshuo Wang***†

- In replay-free continual learning of vision–language models, naive fine-tuning drifts the image–text alignment geometry and degrades zero-shot transfer and prompt robustness.
- We recast forgetting as alignment-geometry drift and propose PI-CCA, a compact prompt-invariant CCA certificate that preserves canonical spectra and subspaces during adaptation. PI-CCA achieves state-of-the-art replay-free performance with strong zero-shot retention across VL–CL benchmarks.

S^2-KD: Semantic-Spectral Knowledge Distillation Spatiotemporal Forecasting *(AAAI 2026)*

Wenshuo Wang, *Yaomin Shen, Yingjie Tan, Yihao Chen*†

- Existing KD for spatiotemporal forecasting, even frequency-aware variants, operate in a semantic vacuum: they can mimic spectral patterns but not the causal "why". This fundamentally limits lightweight students in complex, non-stationary and OOD dynamics.
- We introduce S^2-KD: a text-informed multimodal teacher whose fused semantic–spectral representation is distilled into lightweight vision-only students. With simple joint feature and spectral alignment, tiny models nearly match large domain-specialist teachers on WeatherBench, TaxiBJ+ and Prometheus.

Alleviating Choice Supportive Bias in LLM with Reasoning Dependency Generation *(preprint)*

Nan Zhuang,* ***Wenshuo Wang*****, Lekai Qian, Yuxiao Wang, Boyu CAO, Qi Liu*† *(* Equal Contribution)*

- Large language models used as evaluators exhibit strong choice-supportive bias, which the paper reframes as misaligned reasoning dependency on "chosen vs. unchosen" status instead of on evidence.
- We propose RDG to generate small, structured datasets that reshape these dependencies and fine-tune the model. With only a few thousand RDG examples, choice-supportive bias is sharply reduced while broader fairness and social-bias metrics remain essentially unchanged.

Inverse Design for Causal Graph Annotated Text Generation *(preprint)*

***Wenshuo Wang**, Boyu CAO, Nan Zhuang, Wei Li*[†]

- Real-world text datasets with causal structure annotations are scarce and costly. This fundamentally impedes the advancement of causal discovery in text.
- We propose iTAG, a pipeline that introduces inverse design into text generation. iTAG can transform target directed acyclic graphs (DAGs) into indistinguishable natural text while preserving the specified causal structure. The synthetic datasets, when applied to existing text causal discovery models, maintain causal discovery metrics that are highly consistent with those on real-world text.

Enhancing Multimodal Emotion Analysis through Fusion with EMT Model Based on BBFN *(TCSISR 2024)*

Wenshuo Wang

- Real-world text datasets with causal structure annotations are scarce and costly. This fundamentally impedes the advancement of causal discovery in text.
- We propose iTAG, a pipeline that introduces inverse design into text generation. iTAG can transform target directed acyclic graphs (DAGs) into indistinguishable natural text while preserving the specified causal structure. The synthetic datasets, when applied to existing text causal discovery models, maintain causal discovery metrics that are highly consistent with those on real-world text.

Temporal Data-Driven Short-Term Traffic Prediction: Application and Analysis of LSTM Model *(TNS 2023)*

Xuange Huang, Xinran Li*, **Wenshuo Wang***

- Short-term traffic flow on urban roads can be accurately predicted from temporal data alone, and LSTM networks capture these dynamics better than traditional linear time-series models like ARIMA.
- By training LSTMs on fine-grained loop-detector data from a real highway and comparing them to ARIMA baselines, the paper shows that LSTMs track future traffic fluctuations more closely and generalize better. This makes them more suitable for practical short-term traffic management.

INTERNSHIP EXPERIENCE

Huawei Beijing Research Institute, Algorithm Engineer Intern, Beijing, China **2024.07-2024.10**

- Developed NLP models for user review analysis and medical text understanding, including text vectorization with XGBoost/Random Forest, BERT-based multi-label classification, T5-based summarization, and evaluation of generative models.
- Designed and implemented a medical conversational agent using Streamlit, SimCSE + Faiss retrieval, Alibaba Cloud text embeddings, and GLM-4-0520 for domain-specific question answering.

COMPETETIONS AND AWARDS

- **Kaggle, Yale/UNC-CH - Geophysical Waveform Inversion.** *Bronze Medal, 81/1365, Top 5.9%* **(2025)**
- **Kaggle, NeurIPS - Ariel Data Challenge.** *Silver Medal, 49/1151, Top 4.3%* **(2024)**
- **Kaggle, Home Credit - Credit Risk Model Stability.** *Silver Medal, 23/3856, Top 0.6%* **(2024)**

SKILLS AND INTERESTS

Programming: Python, Pytorch

Languages: English (TOFEL iBT 91)

Research Interests: In the short term, my goal is to **strengthen my research methodology**. I have worked in different labs with different advisors on both mainstream topics such as LLMs and VLMs, as well as less mainstream areas including causal inference and spatiotemporal forecasting. In the long term, my primary research goal is to **advance efficient scientific computing through deep learning**.