Ziyan Huang

+86-13850318831
mathziyanhuang@163.com

CET-6 Score: 502

Education

•Hohai University (211 Program) *Sep 2020 – Jun 2024*
B.S. in Information and Computing Science; GPA: 4.29/5.0 Nanjing, China

•Central South University (985 Program) *Sep 2024 – Jun 2027 (Expected)*
M.S. in Mathematics; GPA: 3.59/4.0 Changsha, China
Supervisor: Hongqiao Wang, Associate Professor

Research Experience

•Targeting CVPR: Physen-N2N: A physics-guide Self-Supervised Learning for Nonblind Image Deconvolution in Biased Complex Noise *First author*
Design the algorithm, conducted experiments, and authored the paper

- **Self-Supervised Learning** This study presents a self-supervised deep learning framework designed to solve inverse problems under biased complex noise conditions. The framework first maps noisy data to a clean image combined with the noise expectation. It then incorporates a physical model into the loss function as an auto-regressive training strategy, enabling joint optimization of both the clean image and the noise distribution expectations.
- **Theoretical Analysis** A theoretical framework is proposed to elucidate the proposed PN2N method based on joint optimization through natural constraints of physical models, revealing the characteristic natural constraint contained within blur kernel.

•Project: Gaussian Process Surrogate Modeling and Uncertainty Quantification for Cylinder Test and Small-Sample Parameter Calibration of Detonation Models *Member*
Conduct experiments and develop code

- This project, in collaboration with the Beijing Institute of Applied Physics and Computational Mathematics, focuses on the small-sample problem arising from high experimental costs and low numerical simulation efficiency in complex detonation problems.
- **Physics-Constrained Surrogate Model** The project employs a Gaussian process surrogate model, incorporating physical constraints to develop a physics-enhanced surrogate model for detonation. Compared to traditional Gaussian process regression models, the new model significantly reduces prediction errors.
- **Parameter Estimation** Within an inverse problem framework, a two-stage optimization strategy is employed: initially, the unknown parameters are calibrated and their uncertainties are quantified based on observational data. Subsequently, the uncertainty bounds derived from this initial calibration are used as constraints in a second optimization stage to determine the optimal parameter set that best matches the observations.

Internship Experience

•Peking University Changsha Institute for Computing and Digital Economy *Nov 2024 – Feb 2025*
LLM Algorithm Intern Changsha, China

- **Data Processing and Generation** Web scraping is conducted on quasi-psychological counseling QA data and text classification data from platforms such as Weibo and Douban. The data is cleaned, filtered, and formatted to construct high-quality QA pair datasets for LoRA fine-tuning and labeled datasets for text classification. A prompt engineering workflow is designed, leveraging DeepSeek-V3 to diversify and enhance QA rewrites, thereby improving corpus diversity. Based on testing feedback, specific sentence structures and domains are optimized iteratively to continuously enhance the model's performance
- **Dialogue Classification and Implementation** Multi-task training is performed using the BERT model on text data with emotion and event labels, enabling the AI to identify user emotion categories and event types. Graded alerts are implemented based on emotional intensity and event attributes.
- **Empathy Capability Optimization** An empathy quantification evaluation model is researched and introduced as the core reward criterion for reinforcement learning. A multi-dimensional reward function is constructed by combining text fluency and emotional alignment.

Technical Skills and Interests

Research Interests: Computational Imaging, Imaging science, Deep Learning, Uncertainty Quantification
Skills and Strengths:

- Proficient in DL, with project experience in downstream tasks and fine-tuning of LLM
- Experience in Optical: Solid understanding of imaging principles and optical theory
- Familiar with Bayesian Neural Networks and Gaussian Process Regression for statistical learning applications

Honors and Awards

• Honorable Mention (MCM) • First-Class Scholarship (CSU) • Second-Class Scholarship (CSU)
• Academic Excellence Scholarship (HHU) • Science and Technology Innovation Scholarship (HHU)