WANG MA

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SUMMARY

Ph.D. student specializing in Uncertainty Quantification and Bayesian Deep Learning for trustworthy AI. Seeking a Summer 2026 Research Internship to apply expertise in Uncertainty Quantification and Bayesian Modeling to solve challenging real-world problems. Proven experience in developing novel algorithms from theory to implementation in vision and language tasks.

EDUCATION

Rensselaer Polytechnic Institute (RPI) 08/2024 – 05/2029 (Expected)

- **Ph.D.** in **Computer & System Engineering**
- **Adviser:** Prof. Qiang Ji
- **Research Interests:** Uncertainty Quantification, Bayesian Deep Learning, Knowledge Prior

Southern University of Science and Technology (SUSTech) 08/2020 – 07/2024

- **B.S.** in **Data Science and Big Data Technology**
- **Primary Background:** Optimization, Statistics and Machine Learning

University of California, Irvine 03/2023 – 07/2023

- **Exchange Student**
- Individual study on Meta Learning and Reinforcement Learning, supervised by Prof. Hengrui Cai.

INDUSTRIAL EXPERIENCE

Research Intern 05/2025 – 08/2025
IBM Research *Yorktown Heights, NY*

- **Mentor:** Dr. Debarun Bhattacharjya
- Black-box Uncertainty Quantification and Decomposition for LLMs (**Working paper**)
  - Developed a novel perturbation-based framework for UQ in black-box LLMs, enabling uncertainty decomposition without requiring access to model weights or intermediate results.
  - Introduced an ensemble-of-ensembles method to disentangle aleatoric and epistemic uncertainty, using input perturbations as a proxy for parameter variability.

ACADEMIC EXPERIENCE

Graduate Research Assistant 09/2024 – Present
RPI *Troy, NY*

- **Adviser:** Prof. Qiang Ji
  - Led the implementation of core algorithms and established performance baselines for a novel Causal Saliency Map project (**Working paper**).
  - Developed a contrastive learning framework to disentangle semantic and nuisance uncertainties, achieving state-of-the-art performance on multiple benchmarks (**Paper under review**).
  - Developed and implemented **efficient uncertainty quantification** methods for single models, both theoretically and practically. Theoretically, derived results from NTK theory to effectively quantify uncertainty in regression using only one auxiliary neural network. Practically, implemented and advanced credal interval-based methods for UQ (Technical Report).

Undergraduate Researcher 03/2024 – 08/2024
SUSTech *Shenzhen, China*

- **Adviser:** Prof. Chao Wang
- **Main Concentration:** Unpaired Image Denoising via VAE & Diffusion-based Hyperspectral Image Restoration
  - Designed and implemented a self-supervised hyperspectral image restoration method using a novel combination of Implicit Neural Representations (INR) and Diffusion Models.
  - Implemented and optimized a Variational Autoencoder (VAE) for unpaired image denoising, enhancing performance through Mutual Information maximization.

ACADEMIC ENGAGEMENT

Seminar Organizer: AI: Optimization, Theory & Responsibility 07/2024 – 09/2024
SUSTech *Shenzhen, China*

- Organized a graduate-level seminar under the supervision of Prof. Chao Wang.
- Presented talks on Bayesian Optimization and Bayesian Neural Networks.

Seminar Participant & Speaker 06/2023 – 09/2023
SUSTech *Shenzhen, China*

- Active participant in a seminar on Self-Supervised Learning.
- Delivered presentations on Meta-Learning and Optimizers.

SKILLS

Languages	Mandarin Chinese (Native), English (Fluent), Japanese (Conversational)
Programming	Python (PyTorch, NumPy, Pandas, Scikit-learn), Java, MATLAB
Developer Tools	Git, Docker, LaTeX, Linux

AWARDS & HONORS

SUSTech Excellent Undergraduate Graduation Project 06/2024
Thesis: End-to-end Unpaired Image Denoising Based on Mutual Information Enhancement *Shenzhen, China*

Second Prize in Guangdong Province, Mathematical Contest in Modeling 10/2021

Excellent Student Scholarship (Two-time recipient) 09/2021, 09/2022
SUSTech *Shenzhen, China*