Ge YAN

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RESEARCH INTEREST

My research interest is mainly in **trustworthy machine learning** and **responsible AI**. My goal is to make current machine learning models **more robust and interpretable** and provide a quantification of **uncertainty**.

EDUCATION

Department of Computer Science and Engineering, UC San Diego Current

Ph.D. student advised by **Prof. Lily Weng.**

Department of Electrical and Computer Engineering, UC San Diego Mar 2023

M.S. in Machine Learning and Data Science (GPA 3.95/4)

School of Mathematical Sciences, Peking University Jun 2021

B.S. in Information and Computing Science (GPA 3.484/4)

SKILLS

Programming Languages: Python, C. **Proficiency** in Python (**8+ years** of experience).

Solid mathematical foundation: linear algebra, probability, mathematical/real analysis.

Rich experience in conducting deep learning experiments with Pytorch.

RESEARCH EXPERIENCE

Improve the efficiency of robust conformal prediction methods **(Submitted to ICLR24. Avg. score 7 after review)**

Advisor: Professor Lily Weng, UC San Diego

- Studied robust conformal prediction which generates prediction sets that are robust against adversarial examples.
- Provided a theoretical analysis and proposed two methods based on theoretical insight.
- Successfully reduced the inefficiency of the current baseline by up to 48.80% on ImageNet.

Failure probability estimation via Bayesian neural networks

Advisor: Professor Chao Yang, Peking University

- Used Bayesian neural network as a surrogate model to reduce the requirement of expensive Monte-Carlo sampling.
- Introduced uncertainty information in Bayesian neural network as correction criteria.
- Performed probability estimation with about 1% Monte-Carlo sample number.

Neural network architecture design with ordinary differential equation numerical schemes

Advisor: Professor Bin Dong, Beijing International Center for Mathematical Research (BICMR)

- Refined the skip connection in Resnet leveraging numerical algorithms in solving ordinary differential equations, like Adams algorithm and three-step linear multistep method.
- Explored the influence of different skip connections inspired by different numerical algorithms on the model performance on CIFAR-10, a popular image classification dataset.
- Achieved 92.2% accuracy on CIFAR-10 using the refined model, outperformed the original Resnet by 0.9%.