Tunyu Zhang

Undergraduate
in Artificial Intelligence
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GitHub

Summary

I am Tunyu Zhang, an undergraduate student at the University of Science and Technology of China(USTC). At this stage, I am focusing on sampling theory and other fields under the guidance of my mentor Prof. Difan Zou of HKU. My primary research interests lie in the realms of machine learning and generative models. Specifically, I aim to unravel the intricacies of contemporary machine learning models by delving into optimization problems, analyzing unique datasets (such as sparse data), investigating data generation processes, and scrutinizing neural network structures.

Education

Degree	Institute	GPA	Year
B.Tech	University of Science and Technology of China	3.62/4.3	2021-

Experience

- **National Natural Science Lab: MOE Key Laboratory** *September 2021 - September 2022*
  STUDENT RESEARCH ASSISTANT WITH PORF. YU-QING WANG Heifei, China
  – Study of non-equilibrium phase transitions mechanisms in exclusive network and node model of heterogeneous assignment based on real experimental data of KIF3AC and KIF3CC motors.
  – Study physical mechanisms of exit dynamics in micro channels of non-equilibrium transport systems.
  – Try to use machine learning methods to diagnose faults in industrial bearings.
- **The Computer Science Department of The University of Hong Kong** *July 2023 - Now*
  STUDENT RESEARCH ASSISTANT WITH PORF. DIFAN ZOU Hong Kong, China
  – Study of sampling method, especially for discrete data sampling and sparse data sampling.
  – Study of compressed sensing and the theory of diffusion model.

Projects

– **SZD image generation** *Mar 2021 - Apr 2021*
Electromagnetics Course Paper **Github**
∗ Tried to use CGAN to predict the microstructure of electromagnetic thin films
∗ Introduced ACGAN to solve the mode crash
∗ Implemented a complete, user-friendly, and scalable visual training tool

Technical Skills

–**Programming Languages**: C/C++, Python
–**Tools and Frameworks**: Jupyter, VScode, Pytorch, Pandas & Numpy
–**Operating Systems**: Windows, Linux & MacOS

Key courses taken

–**Physics & Maths**: Mechanics B, Calculus I, Thermotics B, Linear Algebra B1, Electromagnetism C, Probability Theory and Mathematical Statistics, Quantum Physics, Stochastic Process B, Calculus II, Calculus III Function of Complex Variable B , Discrete Mathematics, Regression Analysis & Machine Learning (Convex Optimization)
–**CSE & AI**: Computer Programming A, Data Structure and Algorithm, Basic Circuit Theory, Fundamentals of Electronic Technology, Fundamentals of Scientific Programming with Python & Introduction to Computing Systems A

Publications

1.Study of non-equilibrium phase transitions mechanisms in exclusive network and node model of heterogeneous assignment based on real experimental data of KIF3AC and KIF3CC motors
2.Physical mechanisms of exit dynamics in micro channels of non-equilibrium transport systems

Honors & Awards

– **Outstanding Student Scholarship Gold Award**,awarded to students with excellent achievements *2022*
– **Cyrus Tang Moral Education Scholarship**,awarded to students with good performance *2022*
– **Second Prize of Asia and Pacific Mathematical Contest in Modeling**,awarded to players with outstanding performance *2022*
– **Outstanding Student Scholarship Bronze Award**,awarded to students with excellent achievements *2023*