

Tianrui Zhang

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EDUCATION

Institute for Interdisciplinary Information science, Tsinghua University, Beijing, China

Aug 2021- Now

Major in computer science

Major GPA: 3.82/4.0

Core Courses: *Introduction to Computer Science (A-) / Abstract Algebra (A) / Introduction to programming (A-) / Artificial Intelligence: from Principle to Practice (A-) / Algorithm Design (B+) / Database System (B+) / AI+X Computing Acceleration: From Algorithms Development, Analysis to Deployment (A-) / ...*

PUBLICATIONS

Tianrui Zhang, Haochong Xia, Qianfei Hu. "Chatbot Combined with Deep Convolutional Neural Network for Skin Cancer Detection", in Proceedings of the 2022 3rd International Conference on Artificial Intelligence and Education (IC-ICAIE 2022), pages 35-41.

RESEARCH EXPERIENCES

Dynamic 3DGS | Tsinghua University | Research Assistant

Feb 2024- Now

Advisor: Xiaolong Wang, Assistant professor at ECE, UCSD

- Based on 3D Gaussian Splatting, develop a method to deal with dynamic scenes without camera poses
- Using incremental approach to grow the gaussian set for unseen parts
- Using relative poses to facilitate the estimation of camera poses

Acoustic Synthesis | Tsinghua University | Research Assistant

Apr 2022- May 2023

Advisor: Hang Zhao, Assistant professor at Institute for Interdisciplinary Information Science, Tsinghua University

- Researched the synthesis of room impulse response under a fixed source distribution and arbitrary receivers through a physical way (by considering the geometric and diffractive part respectively).
- Found the similarity between geometric acoustic fields and geometric optic fields and came up with the idea to solve geometric acoustic fields using neural optical ways.
- Built the geometric model similar to NeRF under the acoustic case (using sampling retracing to solve the geometric part) and the diffractive part based on Hugen's principle.
- Achieved a SOTA over existed researches in similar cases, which is up to 30% improvement in spectral loss and 27% improvement in percentage difference of RT30.

Neural cancer detection | Online | Research Assistant

Jan 2022-Jun 2022

Advisor: Mark Vogelsberger, Associate professor at MIT, Hubblefellow in 2012-2013

- Researched the diagnosis of cancers, especially skin cancers using neural networks.
- Implemented a encoder-decoder model (similar to transformer) and utilize batch normalization for this task.
- Combined this model with an interactive chatbot based on language model for chatting diagnosis.
- Achieved an accuracy of no less than 95% for the dataset Skin Cancer MNIST: HAM10000. This paper was fully accepted by IC-ICAIE 2022.

HONOR

- Gold medal of 37th Chinese physics Olympiad (50/621)

Oct 2020

- Scholarship for Freshmen (30/ 100)

Oct 2021

SKILLS

Solid programming skills and strong physics background

Programming Languages: C/C++, basic Python and usage of popular AI packets (like Torch or Tensorflow), Matlab, Java, Typescript

Standard English Tests: GRE: Verbal - 650 (93% percentile) Quantitative - 800 (94%) Analytical Writing - 4.0

TOEFL: Total 107 (Reading 30, Listening 29, Speaking 23, Writing 25)