Tianzhe Chu

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Education

- **ShanghaiTech University** — Shanghai, China
  3rd year undergraduate in Computer Science and Technology;GPA:3.75/4.0 — *Sep 2020 - Jun 2024*
  Selected Courses: Introduction to Machine Learning, Probability and Statistics, Computer Architecture I, Data Structure and Algorithms.
- **University of California, Berkeley** — Berkeley, CA, US
  EECS, Visiting Student in GLOBE Program;GPA: 3.87/4.0 — *Aug 2022-May 2023*
  Selected Courses: Deep Learning, Deep Reinforcement Learning, Foundation of Graphics, Applications of Parallel Computing, Computer Vision.

Research Interest

- Unsupervised/Self-supervised Learning, Transfer/Continual Learning, Interpretable Deep Learning Architectures, Generative Model, Neural Rendering

Publications

(* means equal contribution)

- **Tianzhe Chu***, Shengbang Tong*, Tianjiao Ding*, Xili Dai, Benjamin D. Haeffele, René Vidal, Yi Ma, *Image Clustering via the Principle of Rate Reduction in the Age of Pretrained Models*, Under Review.
- Yaodong Yu, Sam Buchanan, Druv Pai, **Tianzhe Chu**, Ziyang Wu, Shengbang Tong, Benjamin D. Haeffele, Yi Ma, *White-Box Transformers via Sparse Rate Reduction*, Under Review.

Research Experience

- **Berkeley Artificial Intelligence Research (BAIR) in UC Berkeley** — Berkeley, CA, US
  Undergraduate research assistant advised by Prof. Yi Ma — *Nov 2022-Now*
  - Pushing the limits of image clustering at scale.
  - Designing unified learning frameworks for discriminative and generative purposes.
  - Exploring interpretable deep learning architectures.

Project Highlights

- **Scaled Image Clustering** — Berkeley, CA, US
  Mentor: Prof. Yi Ma and Dr. Benjamin David Haeffele — *Mar 2023 - May 2023*
  - We propose a novel image clustering pipeline that integrates pre-trained models and rate reduction, enhancing clustering accuracy and introducing an effective self-labeling algorithm for unlabeled datasets at scale.
- **Linearizing, Clustering and Regeneration via Closed-Loop Transcription** — Berkeley, CA, US
  Mentor: Prof. Yi Ma and Dr. Benjamin David Haeffele — *Nov 2022 - Now*
  - We are extending the newly proposed image clustering algorithm via doubly stochastic optimization of rate reduction objectives into Closed-Loop settings. We hope this new framework will achieve promising performance in Transfer Learning.
- **White-box Transformers** — Berkeley, CA, US
  Mentor: Prof. Yi Ma — *Feb 2023 - May 2023*
  - We develop white-box transformer-like deep network architectures which are mathematically interpretable and achieve performance very close to ViT.

Activities and Awards

- **Outstanding Individual Award as Leader of Social Practice Group** — Enshi, Hubei, China
  Affiliation: ShanghaiTech University — *July 2021*
- **Outstanding Individual Award as Member of Industrial Practice Group** — Shanghai, China
  Affiliation: ShanghaiTech University — *July 2022*
- **Provincial First Prize for 35th National Physics Olympics Competition** — Nanjing, Jiangsu, China
  Affiliation: Suzhou High School of Jiangsu Province — *Sep 2018*

Skills

- PyTorch, Python, C/C++, Matlab, Chinese, English, Music Sheet