

Haowen Guan

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Education and Award

University of Massachusetts Boston · *Doctor of Philosophy* **Jan. 2024–Present**

Ph.D. in Computer Science | Focus: Computer Vision, Self-Supervised Learning

New York University · *Master of Science* **Sep. 2021–May 2023**

Data Science | Specialization: Deep Learning, Computer Vision | GPA: 3.85/4.0

University of Washington · *Bachelor of Science* **Sep. 2018–Jun. 2021**

Double Major: Physics and ACMS (Data Science and Statistics) | GPA: 3.81/4.0 (Physics), 3.89/4.0 (Data Science)

Ranked in the **Top 0.21%** Globally in [Competitive Programming](#)

Work Experience

DeepTracer · *Senior Backend Algorithm Engineer* **Jun. 2020–Jun. 2023**

- Led the 3D microscopy image data preprocessing team at DeepTracer (<https://deeptracer.uw.edu/about-us>).
- Researched advance deep learning techniques for the automated protein structures prediction.
- Constructed multiple computer vision data pipelines in PyTorch, trained models weights, and deployed in production.

Selected Projects

Data-Free Federated Knowledge Exchange | *Python, PyTorch, Computer Vision* **May. 2023**

- Proposed Knowledge Exchange (KE), a deep learning technique for bidirectional knowledge transfer between models.
- Designed the DFFKE framework, outperforms state-of-the-art baselines by 19.85% on computer vision benchmarks.

[Semi-Supervised Object Detection Competition](#) | *PyTorch, Detectron2* **May. 2023**

- Experimented multiple supervised and semi-supervised object detection algorithms. Implemented a state-of-the-art semi-supervised algorithm – Unbiased Teacher v2.0, trained and fine-tuned the model.
- Participated in the NYU CV Competition and won 2nd place with a detection average precision (AP) of 30.5.

[Galaxy Dataset Distillation](#) | *Python* **Dec. 2022**

- Conducted research on a novel CV topic - image dataset distillation. Collaborated with Flatiron Institution astrophysicists. Distilled galaxy properties from images taken by the James Webb Space Telescope.
- Proposed dataset distillation by self-adaptive trajectories matching. This approach outperformed state-of-the-art predecessors in the field. The work has been published by NeurIPS 2023 conference workshop.

Publication

- H. Guan***, X. Zhao, C. Zheng, A. Yang, S. Pei, “Data-Free Federated Knowledge Exchange”. CVPR, 2025. (Submitted)
- H. Guan***, X. Zhao, Z. Wang, Z. Li, J. Kempe, “Galaxy Dataset Distillation with Self-Adaptive Trajectory Matching”. NeurIPS, 2023. <https://doi.org/10.48550/arXiv.2311.17967>
- H. Guan**, D. Si*, “DeepTracer-Denoising: Deep Learning for 3D Electron Density Map Denoising”. IEEE-BIBM, 2022. <https://doi.org/10.1109/BIBM55620.2022.9994879>
- D. Si, J. Chen, A. Nakamura, L. Chang, **H. Guan**. “Smart de novo macromolecular structure modeling from Cryo-EM Maps”. JMB, 2023. <https://doi.org/10.1016/j.jmb.2023.167967>
- D. Si, A. Nakamura, R. Tang, **H. Guan**, J. Hou, A. Firozi, R. Cao, K. Hippe, M. Zhao, “Artificial Intelligence Advances For De Novo Molecular Structure Modeling in Cryo-Electron Microscopy”. WIREs: Computational Molecular Science, 2021. <https://doi.org/10.1002/wcms.1542> (Impact Factor 16.778)

Skills & Interests

Programming Skills: Python, Java, C++, R, SQL, Git, Matlab, Tensorflow, Pytorch, OpenCV.

Coursework: Computer Vision, Big Data, Natural Language Processing, Self-Supervised Learning, Reinforcement Learning.