Daoan Zhang

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EDUCATION

Doctor of Philosophy in Computer Science
University of Rochester · Rochester, NY · Present

Master of Engineering in Electronics Engineering
Southern University of Science and Technology · Shenzhen, Guangdong, China · 2023
· Distinguished Graduate

Bachelor of Engineering in Electronics Engineering
East China Universtiy of Science and Technology · Shanghai, China · 2019

EXPERIENCE

Graduate Research Assistant
University of Rochester **August 2023 - Present, Rochester, NY**
· Conducting research under the supervision of Albert Arendt Hopeman Professor Jiebo Luo.

Research Intern
Tencent **February 2023 - August 2023, Shenzhen, Guangdong, China**
·Build up a large model in genomic research area, named DNAGPT, as the main contributor and the first author of the resulted paper.

Research Intern
Ping An Technology **June 2021 - November 2022, Shenzhen, Guangdong, China**
· Fine-grained unsupervised learning is studied and a new algorithm is proposed to solve the unsupervised segmentation problem.
· The resulted paper Rethinking Alignment and Uniformity in Unsupervised Image Semantic Segmentation was selected as oral paper on AAAI.

Software Engineer
Continental **July 2019 - October 2019, Shanghai, China**
· Development of in-vehicle software.

Software Engineer Intern
Thyssenkrupp Presta AG **May 2018 - September 2018, Shanghai, China**
· Design the whole vehicle software testing process.

SELECTED PUBLICATIONS

DNAGPT: A Generalized Pre-trained Tool for Versatile DNA Sequence Analysis Tasks
bioRxiv · https://arxiv.org/abs/2307.05628
· Developed DNAGPT, an advanced pre-trained language model specialized for interpreting DNA sequences.
· Demonstrated superior model performance in genomic signal recognition, mRNA abundance regression, and artificial genome generation tasks over existing task-specific models.
· Achieved significant model improvements through pre-training methods and a newly designed model structure tailored for diverse DNA analyses.

Rethinking Alignment and Uniformity in Unsupervised Image Semantic Segmentation
Proceedings of the AAAI Conference on Artificial Intelligence · https://doi.org/10.1609/aaai.v37i9.26325
· Researched unsupervised image segmentation, focusing on feature alignments and uniformity in UISS models.
· Developed Semantic Attention Network (SAN) with Semantic Attention (SEAT) module for dynamic pixel-wise and semantic feature generation.
· Outperforming various methods in capturing semantic representations.

Feature Alignment and Uniformity for Test Time Adaptation
Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) · https://arxiv.org/abs/2303.10902
· Developed a novel Test Time Adaptation (TTA) method for deep neural networks to address out-of-distribution test samples.
· Implemented a feature revision strategy focusing on alignment and uniformity, enhancing model adaptability.
· Validated the method's scalability and performance with experiments on four domain generalization benchmarks and four medical image segmentation tasks, consistently surpassing existing TTA methods.

Cross Contrasting Feature Perturbation for Domain Generalization
Proceedings of the IEEE/CVF International Conference on Computer Vision (ICCV) · https://arxiv.org/abs/2307.12502
· Developed an online one-stage Cross Contrasting Feature Perturbation (CCFP) framework to enhance domain generalization by simulating domain shifts without semantic distortion.
· Introduced learnable feature perturbations and semantic consistency constraints, diverging from traditional fixed synthesis strategies.
· Demonstrated notable performance improvements over previous state-of-the-art methods and effectively addressed domain shift issues in out-of-distribution (OOD) scenarios.