Tianqin Li

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EDUCATION

Carnegie Mellon University, School of Computer Science, PA (GPA: 3.83) Aug 2019 – May 2021

Master of Science in Computational Biology

Graduate with Research Excellence

Sun Yat-sen University, China Aug 2015 – June 2019

Bachelor of Science in Biotechnology

National Elite Class for Applicational Science and Technology

University of California, Berkeley, CA Jan 2018 – Aug 2018

Spring & Summer session for Statistic & CS

RELEVANT COURSEWORK

Deep Learning, Machine Learning, Computer System, Algorithm & Advanced Data Structure, Probabilistic Graphic Models, High Dimensional Statistics, Linear Algebra, Neural Computation, Deep Reinforcement Learning & Control

RESEARCH EXPERIENCE

Center for the Neural Basis of Cognition & Computer Science Department, Carnegie Mellon University

Research Intern with Prof. Tai Sing Lee

- **Prototype Memory and Attention Mechanisms for Few Shot Image Generation** March 2021 – Present
  - Hypothesize the role of super-sparse and complex pattern detector neurons in early visual layers resemble "grandmother" cells that facilitate the formation of visual concepts.
  - Design a prototype memory architecture with attention mechanism in image generation task to demonstrate a potential computational mechanism of such cells in facilitating compositional image synthesis and re-configurable parts learning.
  - First-author an ICLR 2022 submission named "Prototype memory and attention mechanisms for few shot image generation" which receives positive reviews.

- **Integrating Spherical Projection into 3D Shape Synthesis** Nov 2020 – June 2021
  - Demonstrate the benefit of spherical representation by developing a differentiable spherical projection layer.
  - Co-author an ICCV 2021 publication named "SurfGen: Adversarial 3D Shape Synthesis with Explicit Surface Discriminators"**.**

Machine Learning Department & Language Technology Institute, Carnegie Mellon University

Research Intern with Prof. Louis-Philippe Morency and Prof. Ruslan Salakhutdinov

- **Learning Weakly-supervised Contrastive Representations** Aug 2020 – Present
  - Propose CI-InfoNCE objective that can incorporate auxiliary information into contrastive representation learning.
  - Provide an *information-theoretic* analysis regards to why the proposed objective (in theory) can achieve the goal.
  - First-author an ICLR 2022 submission named "Learning Weakly-supervised Contrastive Representations" which receives positive reviews.

- **Conditional Contrastive Learning with Kernel** Aug 2021 – Present
  - Aim to alleviate the difficulty of conditional sampling encountered when integrating information into contrastively learned representations using Conditional Mean Embedding Operators from Kernel literature.
  - First-author an ICLR 2022 submission named "Conditional Contrastive Learning with Kernel" which receives positive reviews.

TEACHING EXPERIENCE

CMU 15-387 Computational Perception, Computer Science Department Sep 2021 - present

Instructor: Prof. Tai Sing Lee

- Head Teaching Assistant. Implement and grade all 5 assignments (Computer Vision Algorithms) in modern deep learning library (PyTorch) from scratch. Hold course office hours for students.

CMU 11-777 Multimodal Machine Learning, Language Technology Institute Sep 2021 - present

Instructor: Prof. Louis-Philippe Morency

- Teaching Assistant. Supervise multiple multimodal student research teams on semester-long projects.

CMU 15-386 Neural Computation, Computer Science Department Jan 2021 – May 2021

Instructor: Prof. Tai Sing Lee

- Teaching Assistant. Provide technical support for assignments. Give Guest Lecture on Convolutional Neural Networks. Hold office hours for students.

SELECTED PROJECT

Search Engine and Design Software for Artificially Engineering Living Organism Nov 2016 – Nov 2017

Team Leader, 2017 SYSU-Software Team

Link: https://2017.igem.org/Team:SYSU-Software/Project

- Build customized search engines and design toolkits for creating artificially engineered organisms.
- Win 2017 iGEM **Best Software Project Award** (Totally 310 teams around the globe).

MANUSCRIPTS UNDER REVIEW

Tianqin Li*, Yao-Hung Hubert Tsai*, Martin Q. Ma, Han Zhao, Kun Zhang, Louis-Philippe Morency, Ruslan Salakhutdinov. "Conditional Contrastive Learning with Kernel". Submitted to **ICLR 2022**.
https://openreview.net/forum?id=AAJLBoGt0XM
Review scores: 8 (good paper) – 6 (weak accept) – 6 (weak accept) - 5 (borderline).
* denotes equal contributions.

Tianqin Li*, Yao-Hung Hubert Tsai*, Weixin Liu, Peiyuan Liao, Ruslan Salakhutdinov, Louis-Philippe Morency. "Learning Weakly-supervised Contrastive Representations". Submitted to **ICLR 2022**.
https://openreview.net/forum?id=MSwEFaztwkE
Review scores: 8 (good paper) – 6 (weak accept) – 5 (borderline) - 5 (borderline).
* denotes equal contributions.

Tianqin Li*, Zijie Li*, Andrew Luo, Harold Rockwell, Amir Barati Farimani, Tai Sing Lee. "Prototype memory and attention mechanisms for few-shot image generation". Submitted to **ICLR 2022**.
https://openreview.net/forum?id=lY0-7bj0Vfz
Review scores: 8 (good paper) – 5 (borderline) – 5 (borderline).
* denotes equal contributions.

Zijie Li, **Tianqin Li**, Amir Barati Farimani. "TPU-GAN: Learning temporal coherence from dynamic point cloud sequence". Submitted to **ICLR 2022**.
https://openreview.net/forum?id=FEBFJ98FKx
Review scores: 6 (weak accept) – 6 (weak accept) – 6 (weak accept) – 6 (weak accept) – 6 (weak accept)

PUBLICATIONS

Andrew Luo, **Tianqin Li**, Wen-Hao Zhang, Tai Sing Lee. "SurfGen: Adversarial 3D Shape Synthesis with Explicit Surface Discriminators". Published in IEEE/CVF International Conference on Computer Vision (**ICCV 2021**). https://openaccess.thecvf.com/content/ICCV2021/papers/Luo_SurfGen_Adversarial_3D_Shape_Synthesis_With_Explicit_Surface_Discriminators_ICCV_2021_paper.pdf

Tianqin Li, Mingzhe Hu, and Liao Zhang. "Using SVM Method for Lung Adenocarcinoma Prognosis Based on Expression Level". Published in the 2018 2nd International Conference on Computational Biology and Bioinformatics (**ICCBB 2018**). DOI:10.1145/3290818.3290823

PROFESSIONAL SKILLS

- Programming: Pytorch & Tensorflow (AI), Python / R / Javascript (Web app and visualization), C/C++ (Performance Optimization), SQL (Database).
- Languages: Chinese (native), English (proficient: recent TOEFL test score 110 out of 120)