Likun Cai

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RESEARCH INTERESTS
- Machine learning & deep learning
- Computer vision
- Information theory

EDUCATION

Fudan University, China — Sep. 2020 - Oct. 2022
Computer Science
- Ph.D. program, voluntary withdrawal

ShanghaiTech University, China — Sep. 2017 - Jul. 2020
Master of Science in Computer Science, GPA: 3.57/4.0
- Advisor: Prof. Ning Cai, specialized in machine learning & information theory

Xidian University, China — Sep. 2013 - Jul. 2017
Bachelor of Engineering in Communication Engineering, GPA: 3.6/4.0

RESEARCH EXPERIENCE

VDI Center, ShanghaiTech University — Mar. 2023 - Aug. 2023
Research Assistant with Prof. Hao Wang
- Investigated Bi-level Optimization and its applications in deep learning.

ML & CV Lab, Fudan University — Sep. 2020 - Oct. 2022
Ph.D. Student Researcher
- Research on unsupervised image segmentation and open-world 2D object detection.

NICE, ShanghaiTech University — Sep. 2017 - Jul. 2020
Master Student Researcher with Prof. Ning Cai
- Presented a new objective for better training of generative models based on Amari-α divergence, which generalizes various notions of divergences in information theory, and achieved better image-generation performance.
- Adopted super-resolution models to pre-process adversarial images and filter added adversarial noise.

WORK EXPERIENCE

Amazon AI Lab, Shanghai — Dec. 2020 - Jul. 2022
Applied Scientist Intern with Yi Zhu and Mu Li
- Investigated open vocabulary object detection models with multi-modal information by extending CLIP to object-level representation.
- Built a new large-scale object detection dataset, termed BigDetection, leveraging data from existing datasets (LVIS, OpenImages, Object365) and using a pre-trained language model to merge the label space.
- Investigated pixel-level information clustering for unsupervised image segmentation inspired by self-information and kernel density estimation.

Tencent GYLab, Shanghai — Apr. 2020 - Aug. 2020
Research Intern with Gang Yu
- Investigated makeup transfer models with access to 3D information disentangled by a 3D face reconstruction model.

- Contributed to makeup transfer application on mobile devices by preprocessing face dataset and training tailored style-GAN models.

PUBLICATIONS

1. Yijie Zhou, **Likun Cai**, Xianhui Cheng, Wenchao Ding, Xiangyang Xue, and Zhongxue Gan. "OpenAnnotate3D: Open-Vocabulary Auto-Labeling System for Multi-modal Data." *submitted to ICRA 2024*.

2. **Likun Cai**, Zhi Zhang, Yi Zhu, Li Zhang, Mu Li, and Xiangyang Xue. "BigDetection: A Large-scale Benchmark for Improved Object Detector Pre-training." *CVPR Workshop on Vision Datasets Understanding*. 2022. [paper] [code]

3. **Likun Cai**, Yanjie Chen, Ning Cai, Wei Cheng, and Hao Wang. "Utilizing Amari-Alpha Divergence to Stabilize the Training of Generative Adversarial Networks." *Entropy*. 2020. [paper] [code]

4. Chen, Yanjie, **Likun Cai**, Wei Cheng, and Hao Wang. "Super-Resolution Coding Defense Against Adversarial Examples." *International Conference on Multimedia Retrieval*. 2020. [paper]

TEACHING EXPERIENCE

ShanghaiTech University

Teaching Assistant in Digital Communication	Fall 2019
Teaching Assistant in Information Science and Technology	Spring 2019

SERVICES

Workshop Reviewer
CVPR Workshop on Vision Datasets Understanding 2023

SKILLS

Programming: Python, PyTorch, TensorFlow, Matlab, Java, C/C++.
Languages: Chinese, English: IELTS 7.0 (R 7.5; W 7.0; L 6.5; S 6.5)

REFERENCES

Dr. Yanlin Geng,
Profressor,
School of Telecommunication Engineering at Xidian University,
ylgeng@xidian.edu.cn

Dr. Kai Han,
Assistant Professor,
Department of Statistics and Actuarial Science at the University of Hong Kong,
kaihanx@hku.hk

Dr. Yi Zhu,
Senior Applied Scientist at Amazon AI Lab,
yzhu25@ucmerced.edu