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Xu Cao

Current Position

2022–Present **Machine Learning Engineer**, *Computer Vision Team, SambaNova Systems*.
Focus on Diffusion models, Multimodal Learning

2022–Present **Research Fellow**, *AI Laboratory, Shenzhen Children's Hospital*.
Focus on AI for Social Good, Pediatrics AI

Education

2020–2022 **Master of Science, Computer Science**, *Courant Institute of Mathematical Sciences*, New York University, USA.

2018–2020 **Bachelor of Science, Data Science**, *School of Data Science*, Fudan University, China.

2016–2020 **Bachelor of Science, Chemistry**, *Department of Chemistry*, Fudan University, China.

Publications

Journal Articles

2023 Kenny Moise, Xu Cao, Cecilia Crews, Madeline DiLorenzo, Elena Sizikova, Mindy Knowles, Oge Marques, and Megan Coffee. Exploring the role for ai-based imaging diagnostics in tuberculosis in low resource settings. *Submitted to Royal Society Open Science*, 2023.

2023 Xu Cao and Jianguo Cao. Commentary: Machine learning for autism spectrum disorder diagnosis–challenges and opportunities–a commentary on schulte-rüther et al.(2022). *Journal of Child Psychology and Psychiatry*. Wiley Online Library, 2023.

In Conference Proceedings

2023 Kun Tang, Xu Cao, Zhipeng Cao, Tong Zhou, Erlong Li, Ao Liu, Shengtao Zou, Chang Liu, Shuqi Mei, Elena Sizikova, and Chao Zheng. Thma: Tencent hd map ai system for creating hd map annotations. In *Proceedings of the AAAI Conference on Artificial Intelligence*, 2023.

2023 Xu Cao, Wenqian Ye, Elena Sizikova, Xue Bai, Megan Coffee, Hongwu Zeng, and Jianguo Cao. Vitasd: Robust vision transformer baselines for autism spectrum disorder facial diagnosis. In *ICASSP 2023-2023 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, 2023.

2022 Elena Sizikova, Joshua Vendrow, Xu Cao, Rachel Grotheer, Jamie Haddock, Lara Kassab, Alona Kryshchenko, Thomas Merkh, RWMA Madushani, Kenny Moise, et al. Automatic infectious disease classification analysis with concept discovery. In *Machine Learning for Health (ML4H) 2022 Extended Abstract*, 2022.

2022   Elena Sizikova, Xu Cao, Ashia Lewis, Kenny Moise, and Megan Coffee. Improving computed tomography (ct) reconstruction via 3d shape induction. In *Machine Learning for Health (ML4H) 2022 Extended Abstract*, 2022.

2022   Xu Cao, Xiaoye Li, Liya Ma, Yi Huang, Xuan Feng, Zening Chen, Hongwu Zeng, and Jianguo Cao. Aggpose: Deep aggregation vision transformer for infant pose estimation. In *The 31st International Joint Conference on Artificial Intelligence (IJCAI-22)*, pages 5045–5051, 2022.

2021   Xu Cao and Yanghao Lin. Caggnet: Crossing aggregation network for medical image segmentation. In *2020 25th International conference on pattern recognition (ICPR)*, pages 1744–1750, 2021.

2020   Xu Cao, Fangzhou Lan, Chi-Man Liu, Tak-Wah Lam, and Ruibang Luo. Chromseg: two-stage framework for overlapping chromosome segmentation and reconstruction. In *2020 IEEE International Conference on Bioinformatics and Biomedicine (BIBM)*, pages 2335–2342, 2020.

2019   Xu Cao and Yanghao Lin. Uct-adp progressive bias algorithm for solving gomoku. In *2019 IEEE Symposium Series on Computational Intelligence (SSCI)*, pages 50–56, 2019.

Industry Work Experience

SambaNova Systems

Oct,2022 – Present   ***Machine Learning Engineer***.
Research and develop the latest computer vision algorithm for industry applications (e.g., Multimodal Vision Transformer, CLIP, Diffusion models).

Tencent

May,2021 – Aug,2021   ***Computer Vision Research Scientist Intern***.
Served as one of the core researchers of Tencent's automatic HD map labeling system deployment team. Developed a new algorithm for automatic lane markings and lane change points detection in HD maps. Contributed to a project introducing Tencent's end-to-end AI system for creating HD Map annotations which was accepted by AAAI 2023 and won the Innovative Applications of Artificial Intelligence Award in the IAAI track.

Dow Chemical Company

Sep,2020 – Jan,2021   ***Software Engineer Intern***.
Developed data retrieval softwares for Dow's Integration Group via Microsoft Azure and Microsoft PowerApps. Managed Dow's database and file system via SAP server, GlobalScape, and Microsoft SQL Server.

Research Experience

NYU Langone Health

Aug,2022 – Present   ***AI Model for Monkeypox Diagnosis, Tuberculosis Detection***.
Led a new project for applying mask self-supervised Learning to solve domain adaptation problems for chest X-ray data and submitted it to CVPR 2023.

Advisor   **Dr. Megan Coffee**, *Clinical Assistant Professor, Department of Medicine*, NYU (*Faculty Web-page*)

NYU Center of Data Science

Feb,2022 – Aug,2022   ***AI Model for Tuberculosis Detection, Explainable Artificial Intelligence (XAI)***.
Contributed to two conference papers and published them in ML4H 2022 as the second author and third author.

Advisor   **Dr. Elena Sizikova**, *Assistant Professor, Center of Data Science*, NYU (*Personal Web-page*)

Computer Science Department, The University of Hong Kong

Jun,2019 – Sep,2022   ***Develop Algorithm for Automatic Karyotyping***.
Proposed a new multi-stage automatic chromosomes segmentation algorithm called ChromSeg. Designed an automatic chromosomes' segmentation, classification and annotation software. Presented the research outline in HKU and published a conference paper to BIBM 2020 as the first author.

Advisor **Dr. Ruibang Luo**, *Assistant Professor, Computer Science Department*, The University of Hong Kong (*Personal Web-page*)

Fellowships & Awards

2023 **Innovative Applications of Artificial Intelligence Awards** in ***AAAI 2023*** in Washington, DC, USA.

2023 **AAAI Student Scholarship Grant** in ***AAAI 2023*** in Washington, DC, USA.

2022 **Department Research Fellowship** of Department of Rehabilitation Medicine, Shenzhen Children's Hospital, under ***Guangdong High-level Hospital Construction Fund***.

2022 **IJCAI-AIJ Travel Grant** in ***IJCAI-ECAI 2022*** in Vienna, Austria.

2017-2019 **Outstanding Academic Scholarship** at ***Fudan University*** in Shanghai, China.

2019 **Meritorious Winner** in ***The Mathematical Contest in Modeling (MCM)***.

2016 **Outstanding Freshman Scholarship** at ***Fudan University*** in Shanghai, China.

2015 **Silver Medal** in ***24th China National Biology Olympiad (CNBO)***.

Service

Reviewer **Journals**.
IEEE Transactions on Medical Imaging (TMI)

Conferences.
ICCV 2023; CVPR 2023; ICASSP 2023; ECCV 2022; ECML-PKDD 2022

Workshops.
Vision Transformers: Theory and applications@NeurIPS 2022

Membership **Member**.
Institute of Electrical and Electronics Engineers (IEEE); Association for Computing Machinery (ACM)

Student Member.
Royal Society of Chemistry (RSC)