

JINGYUAN CHEN

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Education

University of Rochester

Sept. 2021–Anticipated May 2025

B.S. in Computer Science & B.S. in Brain and Cognitive Sciences

Coursework:

- Machine Learning
- Computer Vision
- Human Cognition
- Data Mining
- Video Understanding
- Object Recognition
- Multi-modality
- Embodied AI

Work Experience

Tencent AI Lab

May. 2021–Sept. 2021

Computer Vision Research Intern (Supervisor: Yanbo Fan, Jue Wang)

Shenzhen, China

- Proposed solution to world animal surveillance and build snow leopard intelligent monitoring cloud platform
- Implemented and evaluated object detection models, including Faster R-CNN, Yolo, and DETR with multiple backbones such as Res-Net and SWIN, in terms of performance and efficiency
- Deployed data augmentation to resolve challenges of long-tailed, occlude, small targets, and multi-modality dataset; specifically, Mix-Up, Mosaic, Poisson Blending, and other augmentation strategies were implemented
- Achieved performance of 88 mAP among 23 categories of wild animals and 100% recall rate of snow leopards, primary surveillance object, which greatly relieved surveillance pressure of zoologist
- Collaborated with World Wildlife Foundation, platform was selected as part of "Global Biodiversity 100+ Case" at 2020 United Nation Biodiversity Conference

Research Experience

Parkinson's Patient Assessment

May 2021–Sept. 2021

Undergraduate Researcher (Supervisor: Jiebo Luo)

University of Rochester Medical Center and VISTA Group

- Developed digital, vision-based, real-time Parkinson's patient assessment model based on MDS-UPDRS criteria
- Used SOTA pose estimation model, Higher HR-Net, to obtain heatmaps of human anatomical keypoints
- Calculated MDS-UPDRS score using information obtained under multiple tasks, including gait analysis, finger tapping, hand clasping, and hand pro/supination

Vehicle Anomaly Detection–AI City Challenge

Jan. 2021–Apr. 2021

Visiting Researcher (Supervisor: Zhenzhong Chen)

Intelligent Information Processing Lab, Wuhan University

- Developed dual-modality vehicle anomaly detection model to identify stalled and crashing vehicles
- Proposed novel tracking method to fuse pixel-level and box-level (DeepSort) tracking results on targets obtained by fine-tuned Yolov5
- Utilized RGB images and sparse optical flow backtracking algorithm in opposite directions to mine spatio-temporal information between frames, providing more accurate abnormal timestamp

Video Anomaly Surveillance

June 2020–Sept. 2020

Intelligent Transportation System Research Leader (Supervisor: Yajun Fang)

MIT Universal Village Program

- Developed real-time, multi-event anomaly detection algorithm using SVM and achieved accuracy of 92.59%
- Created algorithm to reduce 2D frame feature map dimension to vector by using combined-difference-image and information entropy, which leaves out spatio-temporal information changes among frames on time slot
- Proposed feature event table to compare sensitivity of RGB, HSV, Edge, Corner, Optical Flow, and Saliency Map for different scenarios such as road accidents, explosions, burglaries, fights, and robberies

Publications(2 of 4)

- **J. Chen**, G. Ding, Y. Yang, W. Han, K. Xu, T. Gao, Z. Zhang, W. Ouyang, H. Cai, and Z. Chen, "Dual-Modality Vehicle Anomaly Detection via Bilateral Trajectory Tracing," IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) Workshops, 2021.
- R. Xue, **J. Chen**, and Y. Fang, "Real-Time Anomaly Detection and Feature Analysis Based on Time Series for Surveillance Video," IEEE 5th International Conference on Universal Village, 2020.

Honors & Awards

- **VisDrone 2021 Crowd Counting Challenge**: Ranked 2nd by ICCV Workshop
- **2021 NVIDIA AI City Challenge**: Ranked 3rd by NVIDIA and CVPR Workshop
- **2019 First Tech Challenge World Championship**: Ranked 19th by FIRST
- **2019 First Tech Challenge Hong Kong Division**: Think Award by FIRST

Technical Skills

Programming Languages: Python, Java, C++, HTML/CSS

Technologies/Frameworks: Linux, Windows, GitHub, Docker

Developer Tools: VS Code, Pycharm, Jupyter, Android Studio

Packages: PyTorch, TensorFlow, Keras, Scikit-Learn, MMDetection, MMAction, Pandas, OpenCV, FFmpeg