

# Tianyue Cao

Portfolio: [tianyuecao.netlify.app](https://tianyuecao.netlify.app)

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## EDUCATION

- **Shanghai Jiao Tong University** Shanghai, China  
*Master of Information and Communication Engineering; GPA: 3.91/4.00* Jul 2019 - Mar 2022
- **Shanghai Jiao Tong University** Shanghai, China  
*Bachelor of Computer Science (IEEE Experimental Class); GPA: 3.56/4.30* Sep 2015 - Jun 2019

## SKILLS

- **Languages:** Python, C++
- **Frameworks:** PyTorch, MxNet
- **Research Field:** Computer Vision, Weakly Supervised Object Detection

## EXPERIENCE

- **Tecent - CDG Group**  
*AI Algorithm Engineer* Present
- **Amazon - DGL & Rekognition Group**  
*Applied Scientist Intern* Jun 2021 - Mar 2022
  - **PSS: Progressive Sample Selection for Open-World Visual Representation Learning:** Proposed a novel progressive approach which, at each iteration, selects unlabeled samples that attain a high homogeneity while belonging to classes that are distant to the current set of known classes in the feature space.
- **Flexiv Ltd. - Deep Learning Group**  
*Algorithm Development Intern* Jun 2018 - Sep 2018
  - **Mechanical Arm Keypoint Detection:** Used Mask R-CNN for keypoint detection (MXNet); added a keypoint detection branch and several backbones such as DetNet; Enhanced the keypoint position by introducing Gaussian distribution. Achieved excellent detection performance on the enterprise automobile plug dataset, being used in the robot visual recognition task.

## PROJECTS

- **Automatic Recognition Hit Algorithm of Energy Mechanism (Image Processing, Clustering):** Used monocular camera to recognize the rotating energy mechanism in different positions and angles, and predicted the hitting position. Leveraged DBSCAN clustering method to filter out the noise points interfering with ellipse fitting; Used Perspective-n-Point estimation algorithm to predict the camera pose of large angle pattern. **First prize** of RoboMaster University Championship (RMUC).
- **Multi-label image classification based on graph convolution network (Computer Vision, Graph Neural Network):** Cooperated with Shanghai Firstbrave Information Technology Co.Ltd, designed and developed an multi-label image classification algorithm based on graph convolution network (GCN) on PyTorch for web image annotation. Achieved SOTA **91.9% mAP** on Pascal VOC 07 dataset.

## PUBLICATIONS

- [ECCV2022(In Cast)] **PSS: Progressive Sample Selection for Open-World Visual Representation Learning:** Cao, T., Wang, Y., Xing, Y., Xiao, T., He, T., Zhang, Z., Zhou, H., & Tighe, J.
- [NeurIPS2021] **Learning to Learn Graph Topologies:** Pu, X., Cao, T., Zhang, X., Dong, X., & Chen, S. (2021). Advances in Neural Information Processing Systems, 34.
- [ICCV2021] **CaT: Weakly Supervised Object Detection with Category Transfer:** Cao, T., Du, L., Zhang, X., Chen, S., Zhang, Y., & Wang, Y. F. (2021). In Proceedings of the IEEE/CVF International Conference on Computer Vision (pp. 3070-3079).
- [AAAI2019 Poster] **APRP: an anonymous propagation method in Bitcoin network.:** Yao, Y., Zeng, X., Cao, T., Fu, L., & Wang, X. (2019, July). In Proceedings of the AAAI Conference on Artificial Intelligence (Vol. 33, No. 01, pp. 10073-10074).

## HONORS AND AWARDS

- Outstanding Graduates of Shanghai - Mar, 2022
- Excellent Scholarship - Jan, 2021
- Shenzhen Stock Exchange Scholarship - Jan, 2020
- First Prize of RoboMaster University Championship (Leader of energy mechanism algorithm group) - Aug, 2020
- Outstanding Graduates of Shanghai Jiao Tong University - Sep, 2019