SHUHAN TAN

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https://ariostgx.github.io/website

EDUCATION

School of Data and Computer Science, Sun Yat-Sen University   Aug. 2016 - Jun. 2021
B.E. in Computer Science & Technology
Overall GPA: 91.7/100, Major GPA: 93.1/100, Overall Ranking: 4/214

PUBLICATIONS

1. **Shuhan Tan**, Xingchao Peng, Kate Saenko. Class-imbalanced Domain Adaptation: An Empirical Odyssey. Transferring and Adapting Source Knowledge in Computer Vision (TASK-CV) at European Conference on Computer Vision (**ECCV**), **2020**.

2. Sivabalan Manivasagam, Shenlong Wang, Kelvin Wong, Wenyuan Zeng, Mikita Sazanovich, **Shuhan Tan**, Bin Yang, Wei-Chiu Ma, Raquel Urtasun. LidarSIM: Realistic LiDAR Simulation by Leveraging the Real World. IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**), **2020**, **Oral**.

3. **Shuhan Tan**, Jiening Jiao, Wei-Shi Zheng. Weakly Supervised Open-set Domain Adaptation by Dual-domain Collaboration. IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**), **2019**.

4. Rong Zhang, **Shuhan Tan**, Ruixuan Wang, Siyamalan Manivannan, Wei-Shi Zheng. Biomarker Localization by Combining CNN Classifier and Generative Adversarial Network. Medical Image Computing and Computer Assisted Interventions (**MICCAI**), **2019**.

RESEARCH EXPERIENCE

Simulation for Autonomous Driving   Oct. 2019 - Aug. 2020
Research Intern   **Uber ATG Toronto**

· Advisors: Prof. **Raquel Urtasun**, Prof. **Shenlong Wang**
· **Topic 1: Realistic LiDAR Simulation**.
➢ Designed the method to simulate realistic and interesting 3D scenes with rare objects using LiDAR Simulator and CAD models. Created scenes are useful for efficient edge-case testing for 3D perception of autonomous driving.
➢ Publication: LidarSIM: Realistic LiDAR Simulation by Leveraging the Real World, **CVPR**, 2020, **Oral**.
· **Topic 2: Simulation for Rare Object Identification**.
➢ Aims to improve the performance of 3D open-set panoptic segmentation: identifying known and unknown instances in the self-driving scene.
➢ Proposed to create 3D scene simulation for data augmentation to improve rare object identification performance. Designed and tried out different ways to do automatically search for the most useful 3D scene for auto-augmentation.
➢ Designed a non-parametric method to efficiently optimize the 3D simulation content that effectively improve the performance of a rare object perception model. Using our simulated training data leads to better performance than only using real testing data.
· **Topic 3: Realistic Traffic Scene Generation (ongoing)**.
➢ Aims to automatically generate realistic traffic scenes that can be used for realistic testing or data augmentation in downstream self-driving tasks, *e.g.*, perception and motion prediction.

- ➤ Proposed a data-driven approach to sequentially generate traffic actors to form realistic traffic scenes given map layout. Our method is able to generate traffic scenes across very different map areas in large scale.
- ➤ The proposed method is able to create traffic scenes that well match the real traffic scenes. Using our generated traffics scenes for training data augmentation can also improve 3D vehicle detection performance on real road scenes.

Class-Imbalanced Domain Adaptation
Visiting Researcher

July. 2019 - Sep. 2019
Boston University

- · Advisor: Prof. **Kate Saenko**, Dr. **Xingchao Peng**
- ➤ Aims to remove some impractical assumptions to achieve more practical Domain Adaptation method.
- ➤ Proposed the Class-imbalanced Domain Adaptation problem: how to align feature distributions across domains while the label distributions of the two domains are also different.
- ➤ Designed a large scale benchmark for this problem with 22 cross-domain tasks. Comprehensive experiments on state-of-the-art methods revel that most existing methods cannot handle the coexistence of feature and label distribution shift properly.
- ➤ Proposed a simple yet novel combination current ideas, which outperforms most recent domain adaptation methods on our benchmarks.
- ➤ Publication: Class-imbalanced Domain Adaptation: An Empirical Odyssey, **ECCV** Workshops,2020.

Domain Adaptation and Person Re-Identification
Undergraduate Researcher

Jan. 2018 - June. 2019
Sun Yat-Sen University

- · Advisor: Prof. **Wei-Shi Zheng**
- · **Topic 1: Weakly Supervised Domain Adaptation**.
- ➤ Aims to utilize Domain Adaptation for Person Re-identification problem where we have many partially-labeled data domains (cameras).
- ➤ Proposed the weakly-supervised open-set Domain Adaptation setting, where we relax the conventional assumption in Domain Adaptation that there exists a fully-labeled source domain, as well as the assumption that label spaces of the two domains are identical.
- ➤ Designed a novel algorithm to transfer knowledge bilaterally between two partly-labeled domains, which was the state-of-the-art on both standard datasets and a real-world Person Re-identification.
- ➤ Publication: Weakly Supervised Open-set Domain Adaptation by Dual-domain Collaboration, **CVPR**, 2019.
- · **Topic 2: Multi-source Domain Adaptation for Unsupervised Person Re-Identification**
- ➤ Aims to use Domain Adaptation for Person Re-identification using multiple source data domains.
- ➤ Identified the neglect of data distribution differences of images captured by different cameras in the existing methods for Unsupervised Person Re-identification.
- ➤ Proposed a domain adaptation method that transfers person identity knowledge from multiple labeled datasets to the target domain in a camera-specific fashion. It outperformed existing methods significantly on standard benchmarks.

AWARDS

Meritorious Award, COMAP Mathematical Contest in Modeling (top %7)	Feb. 2018
Excellent Student Scholarship, SYSU (top %5)	Aug. 2017 - Jul. 2018
Excellent Student Scholarship, SYSU (top %5)	Aug. 2016 - Jul. 2017

SKILLS

Programming	C/C++, Python, Matlab, PyTorch, TensorFlow
Language Proficiency	TOFEL: Total 111 (Reading 30, Listening 30, Speaking 24, Writing 27)