Weihua Chen

Ph.D. in Computer Vision

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Education

09/2014 - 02/2018	National Laboratory of Pattern Recognition (NLPR), CASIA	Ph.D. in Computer Vision
09/2009 - 07/2012	Beijing Jiaotong University	M.Eng. in Singal and Information Processing
09/2005 - 07/2009	Beijing Jiaotong University	B.Eng. in Singal and Information Processing

Experience

02/2018 - Present Alibaba DAMO Academy Senior Algorithm Engineer

- **[Research on General Pre-trained Model]** Build a Semantic Controllable Self-Supervised Learning Framework https://github.com/tinyvision/SOLIDER [CVPR23], which can generate general human pre-trained models benefiting to all downstream human visual tasks. The pre-trained model outperforms state of the arts on six downstream human visual task.
- **[Research on Real-Time Object Detection (DAMO-YOLO)]** Develop a fast and accurate object detection framework called DAMO-YOLO https://github.com/tinyvision/DAMO-YOLO. It outperforms state-of-the-art YOLO series and attracts more than **2.5K+ star** on Github.
- **[Research on Unsupervised Domain Adaptation]** Design series of unsupervised domain adaptive methods [ICCV21,ECCV22,ICLR22,TIFS22] for different vision tasks, including segmentation, classification, image retrieval task and object re-identification. Our method has won **2 worldwide challenges** in ECCV20/ICCV21. Besides, we put some attentions on how to generate and refine synthetic images for new scenarios [MM21,MM22].
- **[Research on Person Re-identification]** Provide series of works from different aspects to improve the performance, including quadruplet loss [CVPR17 Spotlight, **Cited 1k+**], multi-task learning [AAAI17 Oral] and representation uncertainty [ECCV22]. Our methods have also won **6 worldwide challenges** in CVPR20/ECCV20/CVPR21/ICCV21.
- **[Build A City-level Security Surveillance Solution]** The solution can track person in city among tens of millions people across thousands of cameras, and has been **deployed to multiple cities**, communities and offline shopping malls in China. Its advanced features: domain gap discovery and automatically fine-tuning; a complete data-collection system; supporting accessory and part retrieval; feature back compatible; incremental learning.
- **[Other Projects]** A visual surveillance system for court; A visual detection SDK for CAD drawings; Time recognizer for Alzheimer patients' drawings;

07/2012-09/2014 National Laboratory of Pattern Recognition (NLPR), CASIA Algorithm Engineer

- **[Build A Multi-Camera Multi-Object Tracking System]** The tracking system has been **deployed to multiple customs and prisons** in China. The proposed algorithm behind this system has become a new benchmark for multi-object multi-camera tracking https://github.com/cwhgn/EGTracker [TCSVT16], and be utilized as baseline in Multi-Camera Object Tracking (MCT) Challenge in ECCV14.

Selected Publications

My research areas are mainly on self-supervised, unsupervised learning and domain adaptation. Authored/co-authored over 10 top-conference and journal papers, including CVPR, ICCV, ECCV, ICLR and etc. Received the championships of multiple challenges in top conferences, *i.e.*, 5 champions, 2 runners-up, 1 third runner-up.

[1] Beyond Appearance: a Semantic Controllable Self-Supervised Learning Framework for Human-Centric Visual Tasks
Weihua Chen, Xianzhe Xu, Jian Jia, Hao Luo, Yaohua Wang, Fan Wang, Rong Jin, Xiuyu Sun
IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**), 2023.

[2] DAMO-YOLO: A Report on Real-Time Object Detection Design
Xianzhe Xu, Yiqi Jiang, **Weihua Chen**, Yilun Huang, Yuan Zhang and Xiuyu Sun
Arxiv 2211.15444.

[3] Reliability-Aware Prediction via Uncertainty Learning for Person Image Retrieval
Zhaopeng Dou, Zhongdao Wang, **Weihua Chen**, Yali Li, and Shengjin Wang
The European Conference on Computer Vision (**ECCV**), 2022.

[4] TAGPerson: A Target-Aware Generation Pipeline for Person Re-identification
Kai Chen, **Weihua Chen**, Tao He, Rong Du, Fan Wang, Xiuyu Sun, Yuchen Guo, Guiguang Ding
The 29th ACM International Conference on Multimedia (**ACM MM**), 2022.

[5] Graph convolution for re-ranking in person re-identification
Yuqi Zhang, Qian Qi, Chong Liu, **Weihua Chen**, Fan Wang, Hao Li, Rong Jin
IEEE International Conference on Acoustics, Speech and Signal Processing (**ICASSP**), 2022.

[6] Adaptive Matching Strategy for Multi-Target Multi-Camera Tracking
Chong Liu, Yuqi Zhang, **Weihua Chen**, Fan Wang, Hao Li, Yidong Shen
IEEE International Conference on Acoustics, Speech and Signal Processing (**ICASSP**), 2022.

[7] Multi-view Evolutionary Training for Unsupervised Domain Adaptive Person Re-Identification
Jianyang Gu, **Weihua Chen**, Hao Luo, Fan Wang, Hao Li, Wei Jiang, Weijie Mao
IEEE Transactions on Information Forensics and Security (**TIFS**), 2022.

[8] CDTrans: Cross-domain Transformer for Unsupervised Domain Adaptation
Tongkun Xu, **Weihua Chen**, Pichao Wang, Fan Wang, Hao Li, Rong Jin
The International Conference on Learning Representations (**ICLR**), 2022.

[9] Exploring the Quality of GAN Generated Images for Person Re-Identification
Yiqi Jiang, **Weihua Chen**, Xiuyu Sun, Xiaoyu Shi, Fan Wang, Hao Li
The 29th ACM International Conference on Multimedia (**ACM MM**), 2021.

[10] Towards discriminative representation learning for unsupervised person re-identification
Takashi Isobe, Dong Li, Lu Tian, **Weihua Chen**, Yi Shan, Shengjin Wang
The IEEE/CVF International Conference on Computer Vision (**ICCV**), 2021.

[11] Beyond Triplet Loss: A Deep Quadruplet Network for Person Re-identification
Weihua Chen, Xiaotang Chen, Jianguo Zhang, Kaiqi Huang
IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**), **Spotlight**, 2017.

[12] A Multi-task Deep Network for Person Re-identification
Weihua Chen, Xiaotang Chen, Jianguo Zhang, Kaiqi Huang
The Thirty-First AAAI Conference on Artificial Intelligence (**AAAI**), **Oral**, 2017.

[13] An Equalised Global Graphical Model-Based Approach for Multi-Camera Object Tracking
Weihua Chen, Lijun Cao, Xiaotang Chen, Kaiqi Huang
IEEE Transactions on Circuits and Systems for Video Technology (**TCSVT**), 2016.

Activities

Competition

The 2nd place in Google Landmark Retrieval Competition (**ILR**) on ICCV 2021.
The 1st place in Multi-camera Multi-Person tracking (**MCMPTC**) on ICCV 2021.
The 1st place in **AICITY** Challenge Track3 Multi-camera Vehicle Tracking on CVPR 2021.
The 1st place in **AICITY** Challenge Track2 Vehicle Re-Identification on CVPR 2021.
The 2nd place in **RobMOTS**: The Ultimate Tracking Challenge on CVPR 2021.
The 1st place Tracking Any Objects (**TAO**) Challenge on ECCV 2020.
The 1st place Visual Domain Adaptation (**VisDA**) Challenge on ECCV 2020.
The 3rd place in **AICITY** Challenge Track2 Vehicle Re-Identification on CVPR 2020.
Organize the Multi-Camera Object Tracking (**MCT**) Challenge in Visual Surveillance and Re-identification Workshop on ECCV 2014

Talk

Invited tutorial talk in IJCB 2021 with the topic of Human-centric Visual Understanding: From Research to Applications.

Serving

Serve as Reviewer for PAMI/TIP/TIFS/TCSVT/CVPR/ICCV/ECCV/NIPS.

Serve as Executive Area Chair for VALSE.

Skills

Programming Languages
- Proficient in C/C++, Python, and Matlab. Experience with Java.

Tools and Frameworks
- Proficient in Caffe and OpenCV.