

Feng Zhou

✉ zhfe99@gmail.com
📄 www.f-zhou.com
🔖 [Google Scholar](#) 🔖 [GitHub](#)



Research Interests

My research is in the area of computer vision and machine learning. I am interested in developing computational methods that can *understand multi-modal data (e.g., image, video, motion capture, depth data) in the wild*. Motivated by this goal, I have been working on the following projects:

🔖 [Fine-Grained Object Recognition](#) 🔖 [Human Pose Estimation](#)
🔖 [Graph Matching](#) 🔖 [Temporal Clustering of Human Behavior](#)
🔖 [Facial Event Discovery](#) 🔖 [Temporal Alignment of Human Motion](#)
🔖 [Facial Landmark Localization](#) 🔖 [Time Mapping & Video Saliency](#)
🔖 [Face Recognition](#)

Education

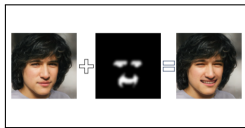
- 2009–2014 **Ph.D. in Robotics**, *Carnegie Mellon University*.
Advisor: Fernando De la Torre
Robotics Institute, School of Computer Science
- 2005–2008 **M.S. in Computer Science**, *Shanghai Jiao Tong University*.
Advisor: Baoliang Lu
Department of Computer Science and Engineering
- 2001–2005 **B.S. in Computer Science**, *Zhejiang University*.
School of Computer Science and Technology

Experience

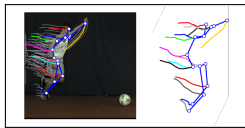
- 2018–Present **Head of Algorithm & Partner**, *Aibee Inc.*
I lead the algorithm team of 🔖 [Aibee](#), where our mission is to **bring the offline world online**. Towards this goal, we had built large-scale AI total solutions to empower and upgrade traditional industries.
- 2016–2018 **Tech Leader**, *Baidu Research*.
Leading a fine-grained recognition team with 20+ members.
Developing deep learning techniques for fine-grained object domains (eg., car/flower/animal/food recognition 🔖 [Baidu AI](#)).
Working on special Solving perception problem in autonomous driving (eg., traffic light recognition, semantic video segmentation).
- 2014–2016 **Researcher**, *Media Analytics Group, NEC Lab*.
Developing deep learning techniques for recognizing objects in fine-grained domain (car, food, flowers, etc.). 🔖 [Live Demo](#).
Developing deep learning techniques for liveness detection (real faces vs masks).

- 2013 Summer **Intern**, *Interactive Visual Media Group, Microsoft Research at Redmond*.
Mentor: Sing Bing Kang and Michael F. Cohen
Developing a video saliency method and a time-remapping technique for generating regular-speed video from a high-speed input, while preserving the important moments in the original.
- 2012 Summer **Intern**, *Advanced Technology Labs, Adobe*.
Mentor: Jonathan Brandt and Zhe Lin
Developing a graph matching method for localizing facial landmark on images.
- 2008–2014 **Staff**, *Human Sensing Lab, Carnegie Mellon University*.
Working on spatial and temporal correspondence problems in computer vision, e.g., human pose estimation, graph matching, temporal alignment and temporal clustering of human motion.
- 2005–2008 **Staff**, *BCMI Lab, Shanghai Jiao Tong University*.
Working on methods for ensemble learning.
- 2005 Spring **Intern**, *Visual Computing Group, Microsoft Research Asia*.
Mentor: Rong Xiao
Improving an Adaboost-based face detection system.
- 2002–2005 **Team Member**, *ACM/ICPC Team, Zhejiang University*.
I spent most of my spare time in college on polishing my programming skill. Collaborating with my colleagues, I participated in many international collegiate programming contests and competitions.

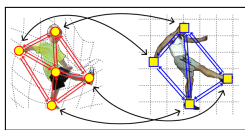
Publications – Journals



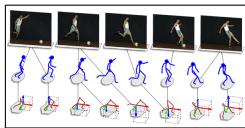
- C. Xiao, Q. Yang, X. Xu, J. Zhang, **F. Zhou** and C. Zhang.
Where You Edit is What You Get: Text-guided Image Editing with Region-based Attention
Pattern Recognition.
(**PR**), 2023.



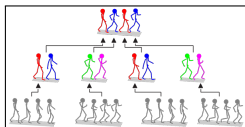
- F. Zhou** and F. De la Torre.
Spatio-temporal Matching for Human Pose Estimation in Video
IEEE Transactions on Pattern Analysis and Machine Intelligence.
(**PAMI**), 38(8):1492-1504, 2016.



- F. Zhou** and F. De la Torre
Factorized Graph Matching
IEEE Transactions on Pattern Analysis and Machine Intelligence
(**PAMI**), 38(9):1774-1789, 2016

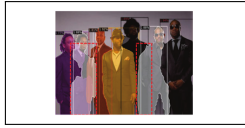


- F. Zhou** and F. De la Torre
Generalized Canonical Time Warping
IEEE Transactions on Pattern Analysis and Machine Intelligence
(**PAMI**), 38(2):279-294, 2016



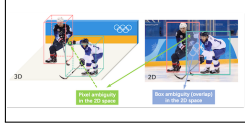
- F. Zhou**, F. De la Torre and J. K. Hodgins
Hierarchical Aligned Cluster Analysis for Temporal Clustering of Human Motion
IEEE Transactions on Pattern Analysis and Machine Intelligence
(**PAMI**), 35(3):582-596, 2013

Publications – Conferences



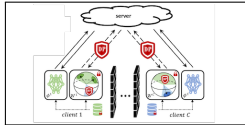
S. Jiang, S. Zhao, M. Wu, L. Zhang and **F. Zhou**

Overlap Loss: Rethinking Weakly Supervised Instance Segmentation in Crowded Scenes
in *IEEE International Conference on Image Processing*
(ICIP), 2023, **Oral**



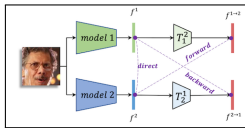
J. Deng, D. Fan, X. Qiu and **F. Zhou**

Improving Crowded Object Detection via Copy-Paste
in *AAAI Conference on Artificial Intelligence*
(AAAI), 2023



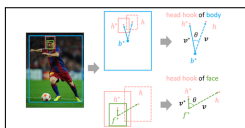
Q. Meng, **F. Zhou**, H. Ren, T. Feng, G. Liu and Y. Lin

Improving Federated Learning Face Recognition via Privacy-Agnostic Clusters
in *International Conference on Learning Representations*
(ICLR), 2022, **Spotlight**



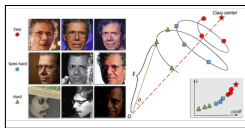
Q. Meng, C. Zhang, X. Xu and **F. Zhou**

Learning Compatible Embeddings
in *IEEE International Conference on Computer Vision*
(ICCV), 2021



J. Wan, J. Deng, X. Qiu and **F. Zhou**

Body-Face Joint Detection via Embedding and Head Hook
in *IEEE International Conference on Computer Vision*
(ICCV), 2021



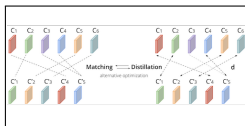
Q. Meng, S. Zhao, Z. Huang and **F. Zhou**

MagFace: A Universal Representation for Face Recognition and Quality Assessment
in *IEEE Conference on Computer Vision and Pattern Recognition*
(CVPR), 2021, **Oral**



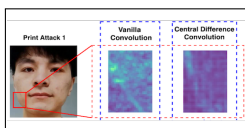
X. Xu, Q. Meng, Y. Qin, J. Guo, C. Zhao, **F. Zhou** and Z. Lei

Searching for Alignment in Face Recognition
in *AAAI Conference on Artificial Intelligence*
(AAAI), 2021



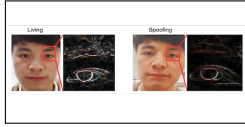
K. Yue, J. Deng and **F. Zhou**

Matching Guided Distillation
in *European Conference on Computer Vision*
(ECCV), 2020

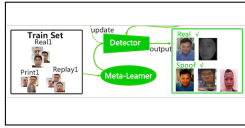


Z. Yu, C. Zhao, Z. Wang, Y. Qin, S. Zhuo, X. Li, **F. Zhou** and G. Zhao

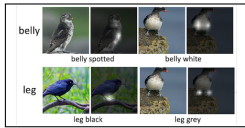
Searching Central Difference Convolutional Networks for Face Anti-Spoofing
in *IEEE Conference on Computer Vision and Pattern Recognition*
(CVPR), 2020



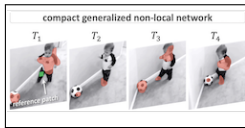
Z. Wang, Z. Yu, C. Zhao, X. Zhu, Y. Qin, Q. Zhou, **F. Zhou** and Z. Lei
Deep Spatial Gradient and Temporal Depth Learning for Face Anti-spoofing
in *IEEE Conference on Computer Vision and Pattern Recognition*
(CVPR), 2020, **Oral**



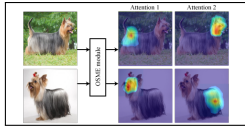
Y. Qin, C. Zhao, X. Zhu, Z. Wang, Z. Yu, T. Fu, **F. Zhou**, J. Shi and Z. Lei
Learning Meta Model for Zero- and Few-shot Face Anti-spoofing
in *AAAI Conference on Artificial Intelligence*
(AAAI), 2020



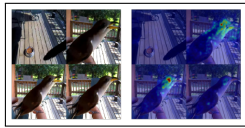
X. Zhao, Y. Yang, **F. Zhou**, X. Tan, Y. Yuan, Y. Bao and Y. Wu
Recognizing Part Attributes with Insufficient Data
in *IEEE International Conference on Computer Vision*
(ICCV), 2019



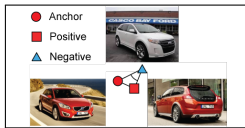
K. Yue, M. Sun, Y. Yuan, **F. Zhou**, E. Ding and F. Xu
Compact Generalized Non-local Network
in *Advances in Neural Information Processing Systems*
(NeurIPS), 2018



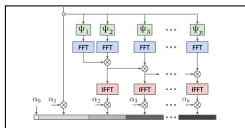
M. Sun, Y. Yuan, **F. Zhou** and E. Ding
Multi-Attention Multi-Class Constraint for Fine-grained Image Recognition
in *European Conference on Computer Vision*
(ECCV), 2018, **Oral**



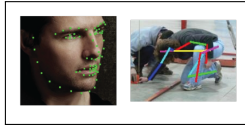
C. Zhu, X. Tan, **F. Zhou**, X. Liu, K. Yue, E. Ding and Y. Ma
Fine-grained Video Categorization with Redundancy Reduction Attention
in *European Conference on Computer Vision*
(ECCV), 2018



J. Wang, **F. Zhou**, S. Wen, X. Liu and Y. Lin
Deep Metric Learning with Angular Loss
in *IEEE International Conference on Computer Vision*
(ICCV), 2017



Y. Cui, **F. Zhou**, J. Wang, X. Liu, Y. Lin and S. Belongie
Kernel Pooling for Convolutional Neural Networks
in *IEEE Conference on Computer Vision and Pattern Recognition*
(CVPR), 2017



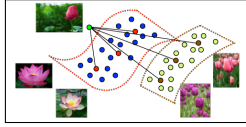
X. Yu, **F. Zhou** and M. Chandraker
Deep Deformation Network for Object Landmark Localization
in *European Conference on Computer Vision*
(ECCV), 2016



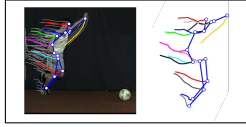
F. Zhou and Y. Lin
Fine-grained Image Classification by Exploring Bipartite-Graph Labels
in *IEEE Conference on Computer Vision and Pattern Recognition*
(CVPR), 2016



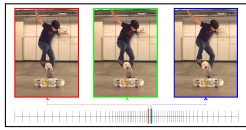
X. Zhang, **F. Zhou**, Y. Lin and S. Zhang
 Embedding Label Structures for Fine-Grained Feature Representation
 in *IEEE Conference on Computer Vision and Pattern Recognition*
 (CVPR), 2016



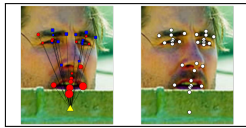
Y. Cui, **F. Zhou**, Y. Lin and S. Belongie
 Fine-grained Categorization and Dataset Bootstrapping using Deep Metric
 Learning with Humans in the Loop
 in *IEEE Conference on Computer Vision and Pattern Recognition*
 (CVPR), 2016



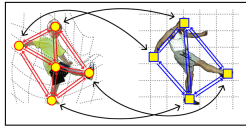
F. Zhou and F. De la Torre
 Spatio-temporal Matching for Human Detection in Video
 in *European Conference on Computer Vision*
 (ECCV), 2014



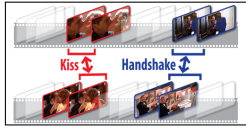
F. Zhou, S.-B. Kang and M. Cohen
 Time Mapping Using Space-Time Saliency
 in *IEEE Conference on Computer Vision and Pattern Recognition*
 (CVPR), 2014



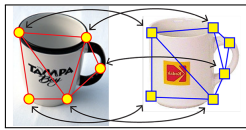
F. Zhou, J. Brandt and Z. Lin
 Exemplar-based Graph Matching for Robust Facial Landmark Localization
 in *IEEE International Conference on Computer Vision*
 (ICCV), 2013



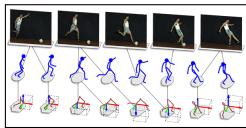
F. Zhou and F. De la Torre
 Deformable Graph Matching
 in *IEEE Conference on Computer Vision and Pattern Recognition*
 (CVPR), 2013



W.-S. Chu, **F. Zhou** and F. De la Torre
 Unsupervised Temporal Commonality Discovery
 in *European Conference on Computer Vision*
 (ECCV), 2012



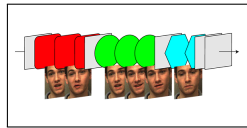
F. Zhou and F. De la Torre
 Factorized Graph Matching
 in *IEEE Conference on Computer Vision and Pattern Recognition*
 (CVPR), 2012



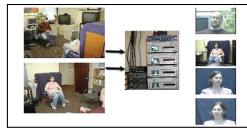
F. Zhou and F. De la Torre
 Generalized Time Warping for Multi-modal Alignment of Human Motion
 in *IEEE Conference on Computer Vision and Pattern Recognition*
 (CVPR), 2012



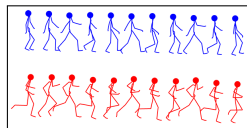
Y. Liu, **F. Zhou**, W. Liu, F. De la Torre and Y. Liu
Unsupervised Summarization of Rushes Videos
in *ACM Conference on Multimedia*
(**ACM MM**), 2010



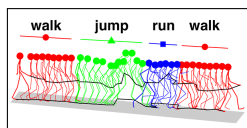
F. Zhou, F. De la Torre and J. F. Cohn
Unsupervised Discovery of Facial Events
in *IEEE Conference on Computer Vision and Pattern Recognition*
(**CVPR**), 2010, **Oral**



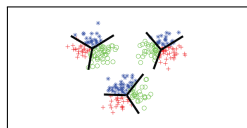
J. F. Cohn, T. Simon, I. Matthews, Y. Yang, M. H. Nguyen, M. Tejera,
F. Zhou and F. De la Torre
Detecting Depression from Facial Actions and Vocal Prosody
in *International Conference on Affective Computing and Intelligent Interaction*
(**ACII**), 2009



F. Zhou and F. De la Torre
Canonical Time Warping for Alignment of Human Behavior
in *Advances in Neural Information Processing Systems*
(**NIPS**), 2009



F. Zhou, F. De la Torre and J. K. Hodgins
Aligned Cluster Analysis for Temporal Segmentation of Human Motion
in *International Conference on Automatic Face and Gesture Recognition*
(**FG**), 2008



F. Zhou and B. Lu
Learning Concepts from Large-Scale Data Sets by Pairwise Coupling with
Probabilistic Outputs
in *International Joint Conference on Neural Networks*
(**IJCNN**), 2007

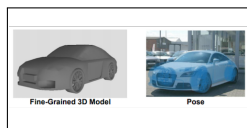
Publications – Others



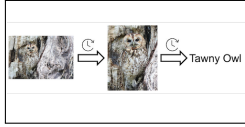
Q. Meng, X. Xu, X. Wang, Y. Qian, Y. Qin, Z. Wang, C. Zhao, **F. Zhou** and Z. Lei
PoseFace: Pose-Invariant Features and Pose-Adaptive Loss for Face Recognition
arXiv:2107.11721, 2021



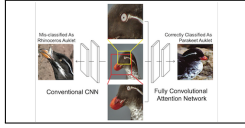
Z. Huang, K. Yue, J. Deng and **F. Zhou**
Visible Feature Guidance for Crowd Pedestrian Detection
in *European Conference on Computer Vision Workshop*
(**ECCVW**), 2020



Y. Wang, X. Tan, Y. Yang, X. Liu, E. Ding, **F. Zhou** and L. Davis
A Refined 3D Pose Dataset for Fine-Grained Object Categories
in *International Conference on Computer Vision Workshop*
(**ICCVW**), 2019



Z. Li, Y. Yang, X. Liu, **F. Zhou**, S. Wen and W. Xu
Dynamic Computational Time for Visual Attention
in *International Conference on Computer Vision Workshop (ICCVW)*, 2017



X. Liu, T. Xia, J. Wang, Y. Yang, **F. Zhou** and Y. Lin
Fully Convolutional Attention Networks for Fine-Grained Recognition
arXiv:1603.06765, 2016

Patents

- 2020 Apr 09 **Method and apparatus for generating vehicle damage information.**
S. Zhao, X. Tan, F. Zhou, E. Ding, H. Sun, J. Deng
US Patent. No: US20200110965 A1
- 2020 Jan 01 **Measuring Method and Apparatus for Damaged Part of Vehicle.**
Y. Zhong, X. Tan, F. Zhou, H. Sun, E. Ding
US Patent. No: US20200005478 A1
- 2019 Aug 01 **Method and apparatus for recognizing video fine granularity, computer device and storage medium.**
X. Tan, F. Zhou, H. Sun
US Patent. No: US20190236419 A1
- 2019 Jun 06 **Method and apparatus for training fine-grained image recognition model, fine-grained image recognition method and apparatus, and storage mediums.**
M. Sun, Y. Yuan, F. Zhou
US Patent. No: US20190171904 A1
- 2018 Sep 13 **Picture recognition method and apparatus, computer device and computer-readable medium.**
F. Zhou, X. Liu
US Patent. No: US20180260621 A1
- 2017 Sep 14 **Deep Deformation Network For Object Landmark Localization.**
X. Yu, F. Zhou, M. Chandrakar
US Patent. No: US20170262736 A1
- 2016 Oct 20 **Fine-grained Image Classification by Exploring Bipartite-Graph Labels.**
F. Zhou, Y. Lin
US Patent, No: US20160307072 A1
- 2014 May 29 **Facial Landmark Localization by Exemplar-Based Graph Matching.**
F. Zhou, J. Brandt, Z. Lin
US Patent. No: US20140147022 A1

Awards

- 2015 **Spot Recognition Award**, *Media Analytics, NEC Lab.*
- 2010 **Best Project Award**, *Machine Learning Class, Carnegie Mellon University.*
- 2007 **Guang Hua Graduate Scholarship**, *Shanghai Jiao Tong University.*
- 2004 **Silver Medal**, *ACM/ICPC Asia Regional Programming Contest.*
- 2001 **Exempt from College Admission Exam**, *Zhejiang University.*
I skipped the final grade (one-year study) in high school and was promoted to college without the national entrance examination.

Academic Services

- Journal Reviewer IEEE Transactions on Pattern Analysis and Machine Intelligence (**PAMI**) 30
International Journal of Computer Vision (**IJCV**) 5
Journal of Machine Learning Research (**JMLR**) 1
IEEE Transactions on Multimedia (**TMM**) 3
IEEE Transactions on Image Processing (**TIP**) 4
IEEE Transactions on Cybernetics (**TSMCB**) 1
Computer Vision and Image Understanding (**CVIU**) 2
Image and Vision Computing (**IVC**) 1
Computers & Graphics (**C&G**) 1
Computer Animation and Virtual Worlds (**CAVW**) 1
Information Processing Letters (**IPL**) 1
Neurocomputing 1
- Conference Reviewer IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**), `14, `15, `16, `17, `18
International Conference on Computer Vision (**ICCV**), `11, `15, `17
European Conference on Computer Vision (**ECCV**), `14, `16
Advances in Neural Information Processing Systems (**NIPS**), `15
SIGGRAPH, `15
Asian Conference on Computer Vision (**ACCV**), `10, `12, `14, `16
Association for the Advancement of Artificial Intelligence (**AAAI**), `15

Intern Supervision

- 2018 Summer Ailing Zheng, University of Hongkong
2018 Summer Xiangyun Zhao, Northwestern University
2017 Spring Yaming Wang, University of Maryland
2016 Summer Yin Cui, Cornell University
2015 Summer Yin Cui, Cornell University
Xiaofan Zhang, University of North Carolina at Charlotte

Teaching

- 2013 Fall Teaching Assistant, Computer Vision Class, Carnegie Mellon University

Talks

- 2014 May Computer Science Department, Shanghai Jiao Tong University
2014 Mar Institute of Deep Learning, Baidu
2014 Mar Media Analytics Group, NEC Lab
2013 Dec Guest Lecture, Computer Vision Class, Carnegie Mellon University
2013 Nov Guest Lecture, Computational Photograph Class, Carnegie Mellon University
2012 Dec Computer Science Department, Shanghai Jiao Tong University
2012 May VASC Seminar, Robotics Institute, Carnegie Mellon University

Computer Skills

- Languages Matlab, Python, Lua, C, C++, Cuda, Java, JavaScript, Html, Css, Lisp, Latex, Sql

Frameworks Caffe, Torch, Django, Bootstrap

Tools Emacs, Adobe Illustrator, Adobe Photoshop, Adobe Premiere Pro