

## Fanyi Xiao

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### CONTACT INFORMATION

2078 Academic Surge  
University of California Davis  
Davis, CA 95616, USA

WWW: [fanyix.cs.ucdavis.edu](http://fanyix.cs.ucdavis.edu)  
Mobile: 949-491-2293  
E-mail: [fanyix.cs@gmail.com](mailto:fanyix.cs@gmail.com)

### RESEARCH INTERESTS

My research interests lie in computer vision. I am also broadly interested in all AI/machine learning topics that could help achieve better visual perception for machines. I have research experiences in object recognition/detection, visual attributes and video data modelling. Currently, I am particularly interested in *mining* weakly supervised dataset for the purpose of exploring, organizing, and harvesting useful information that could help improve various vision tasks.

### EDUCATION

**University of California Davis, Computer Science Dept.**, Davis, CA, USA

Ph.D. student, Computer Science

- Advisor: Prof. Yong Jae Lee

**Carnegie Mellon University, Robotics Institute**, Pittsburgh, PA, USA

M.S., Robotics, 2014

- Advisors: Prof. Martial Hebert and Prof. Yaser Sheikh
- Thesis: *Model Recommendation for Large Scale Exemplar-based Object Detection*

**Central South University, Computer Science Department**, Changsha, China

B.S., Computer Science, 2012

- Thesis: *Facial Expression Analysis with Active Appearance Model*

### PUBLICATIONS

- [1] Fanyi Xiao and Yong Jae Lee. Video object detection with an aligned spatial-temporal memory. In *European Conference on Computer Vision (ECCV)*, 2018.
- [2] Wenjian Hu, Krishna Kumar Singh\*, Fanyi Xiao\*, Jinyoung Han, Chen-Nee Chuah, and Yong Jae Lee (\* equal contribution). Who will share my image? predicting the content diffusion path in online social networks. In *ACM International Conference on Web Search and Data Mining (WSDM)*, 2018.
- [3] Fanyi Xiao, Leonid Sigal, and Yong Jae Lee. Weakly-supervised visual grounding of phrases with linguistic structures. In *Computer Vision and Pattern Recognition (CVPR)*, 2017.
- [4] Fanyi Xiao and Yong Jae Lee. Track and segment: An iterative unsupervised approach for video object proposals. In *Computer Vision and Pattern Recognition (CVPR)*, 2016. (Spotlight presentation).
- [5] Krishna Singh, Fanyi Xiao, and Yong Jae Lee. Track and transfer: Watching videos to simulate strong human supervision for weakly-supervised object detection. In *Computer Vision and Pattern Recognition (CVPR)*, 2016.
- [6] Fanyi Xiao and Yong Jae Lee. Discovering the spatial extent of relative attributes. In *International Conference on Computer Vision (ICCV)*, 2015. (Oral presentation).
- [7] Fanyi Xiao and Martial Hebert. Efficient model evaluation with bilinear separation model. In *Winter Conference on Applications of Computer Vision (WACV)*, 2015.

- [8] Fanyi Xiao, Martial Hebert, Yaser Sheikh, Yair Movshovitz-Attias, Mei Chen, and Denver Dash. Runtime model recommendation for exemplar-based object detection. Technical report, Robotics Institute, Carnegie Mellon University, 2014.
- [9] Zhiding Yu, Chunjing Xu, Deyu Meng, Fanyi Xiao, Wenbo Liu, and Jianzhuang Liu. Transitive distance clustering with k-means duality. In *International Conference on Computer Vision and Pattern Recognition (CVPR)*, 2014.
- [10] Iljoo Baek, Taylor Stine, Denver Dash, Fanyi Xiao, Yaser Ajmal Sheikh, Yair Movshovitz-Attias, Mei Chen, Martial Hebert, and Takeo Kanade. Physical querying with multi-modal sensing. In *Winter Conference on Applications of Computer Vision (WACV)*, 2014.

#### AWARDS

- Best Graduate Researcher Award, CS Dept. of UC Davis, 2018
- Azure Research Award, Microsoft, 2017
- Graduate Fellowship, UC Davis, 2015
- AWS Research Grant (\$10000), Amazon Web Services, Inc., 2015
- Graduate Research Assistantship, CMU, 2013-2014
- Excellent Undergraduate Thesis, CSU, 2012
- Top Grade Scholarship (University-wide highest honor, 0.8%), CSU, 2010
- Sunward Scholarship (0.4%), Sunward Corporation, 2010
- National Scholarship (1%), Ministry of Education of China, 2009
- 1st Grade Scholarship (6%), CSU, 2009

#### EXPERIENCE

##### **NVIDIA Research**, Santa Clara, CA

*Summer Intern*

**July 2017 - Oct 2017**

- Work on action detection in videos. Proposed an iterative method for detecting action tubes.

##### **Disney Research**, Pittsburgh, PA

*Summer Intern*

**June 2016 - Sept 2016**

- Work on weakly supervised vision-language alignment (more specifically, producing segmentation masks for free-form language inputs) by exploiting linguistic structure. [CVPR 2017]

##### **University of California Davis**, Davis, CA

*Graduate Student Researcher*

**Sept 2014 - Present**

- Design of a video object detection algorithm equipped with a *spatial-temporal memory*, which achieves the state-of-the-art performance on ImageNet VID dataset. [ECCV 2018]
- Study how images get propagated in a social network, with the proposed *Diffusion-LSTM*. [WSDM 2018]
- Design of a video object proposal algorithm, which takes a video as input, to output proposals that are either object-like or having distinct motion against the background. [CVPR 2016]
- Proposed a weakly supervised object detection algorithm that transfers *tracked object tubes from video*, i.e., exploiting the extra motion information, to improve object localization. Achieved state-of-the-art performance on PASCAL VOC 2007/2010 in the weakly supervised setting. [CVPR 2016]
- Development of a *visual attribute mining* algorithm which takes the dataset with image-level relative attribute annotation as the input to automatically discover visual elements corresponding to semantic attributes. [ICCV 2015]

**Carnegie Mellon University, Pittsburgh, PA**

*Graduate Research Assistant*

**Sept 2012 - June 2014**

- Proposed the *Bilinear Separation Model* to approximate the exemplar models with low-rank estimators which are learnt by optimizing a task-specific max-margin formulation. [WACV 2015]
- Development of a framework which uses *collaborative filtering* to recommend object detection models for testing images during runtime to avoid exhaustive search, thus scale up the exemplar-based object detection. [CMU TR 2014]

**Intel Science and Technology Center, Pittsburgh, PA**

*Student Researcher*

**Sept 2012 - Aug 2013**

- Development of a multi-modal sensing retailing assistant named “Marvin”. Lead developer of the visual recognition module. [WACV 2014]

**Central South University, Changsha, China**

*Undergraduate Senior Thesis*

**Sept 2011 - June 2012**

- Implementation and analysis of a facial expression classification system based on the Active Appearance Model (AAM) representation.

SKILLS

- Programming: Python, C/C++, Lua, MATLAB, Java
- Misc: PyTorch, Torch7, Caffe, LINUX, L<sup>A</sup>T<sub>E</sub>X

RELATED  
GRADUATE  
COURSES

- CMU: Computer Vision / Machine Learning / Convex Optimization  
Math Fundamentals for Robotics / Learning-based Methods in Vision  
Mechanics of Manipulation
- UC Davis: Visual Recognition

SERVICE

- Reviewer, Computer Vision and Pattern Recognition (CVPR), 2018
- Reviewer, Asian Conference on Computer Vision (ACCV), 2018
- Reviewer, Winter Conference on Applications of Computer Vision (WACV), 2015-2018