Fanyi Xiao

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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. Track and segment: An iterative unsupervised approach for video object proposals. In *Computer Vision and Pattern Recognition (CVPR)*, 2016. (Spotlight presentation).

[2] 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.

[3] Fanyi Xiao and Yong Jae Lee. Discovering the spatial extent of relative attributes. In *International Conference on Computer Vision (ICCV)*, 2015. (Oral presentation).

[4] Fanyi Xiao and Martial Hebert. Efficient model evaluation with bilinear separation model. In *Winter Conference on Applications of Computer Vision (WACV)*, 2015.

[5] 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.

[6] 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.

[7] 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

- 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

Disney Research, Pittsburgh, PA

Summer Intern **June 2016 - Sept 2016**

- Work with Dr. Leonid Sigal on weakly supervised vision-language alignment problem. [In Submission]

University of California Davis, Davis, CA

Graduate Student Researcher **Sept 2014 - Present**

- 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: Torch7, Caffe, Linux, LaTeX

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 / Semantics of Programming Languages
Service	• Reviewer, Winter Conference on Applications of Computer Vision (WACV), 2015-2017