

Peng Zhang

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EDUCATION

Ph. D. in Computer Engineering January 2014 -- Present
Virginia Polytechnic Institute and State University (Virginia Tech), Blacksburg, VA
Advisor: Dr. Devi Parikh

M.S. in Electrical Engineering May 2013
Northeastern University, Boston, MA

Bachelor of Engineering in Automation June 2010
Shandong University, Jinan, China
Honors: Excellence award in Smart Car Competition, Shandong Province

EXPERIENCE

Disney Research, Pittsburg, PA August 2016 -- December 2016
Research Intern
Mentor: Dr. Leonid Sigal

Army Research Laboratory, Adelphi, MD June 2015 -- August 2015
Research Intern
Mentor: Dr. Douglas Summers-Stay
Language Parsing and Understanding

- Developed a system to take summary of a question based on an existing language tool package.
- Designed rules to extract meaningful parts (primary object, secondary object and relation) from summaries.

Computer Vision and Machine Perception Laboratory at Virginia Tech, Blacksburg, VA January 2014 -- Present
Research Assistant

Portfolio System

- Built a neural network to automatically predict best-performing method from candidates.
- Made the system both generic to any vision system and work in end-to-end mode.
- Achieved better performance over all the candidate approaches.

Visual Question Answering

- Built a system to answer binary questions on clipart images with deep learnings.
- Balanced current VQA clipart dataset to eliminate answer bias.
- Reached the state-of-the-art performance on a public dataset.

Alert System

- Built a warning system to predict if a system will fail or not on given input instances.
- No need to run underlying vision system.
- Combined 14 state-of-the-art image features.
- Improved performance on a large variety of applications.
- Demonstrated benefit to downstream applications.

Cognitive Systems Laboratory at Northeastern University, Boston, MA January 2011 -- May 2013
Research Assistant

Image Ranking

- Extracted image attributes via several state-of-the-art image-processing algorithms.
- Utilized machine learning algorithms to classify images with similar clusters.
- Developed non-linear primal support vector machine code to learning to rank.
- Developed images ranking algorithm in the order of user preference.

Clinical Lab Data Error Detection

- Collaborated with doctors at Oregon Health and Science University to detect and analyze erroneous measurements from big clinical dataset.
- Applied machine learning technique to apply the data to mixture model and did Bayesian inference to estimate parameters for corresponding Dirichlet process mixture graphical model.
- Combined kernel density estimation and active learning to detect errors from the dataset.

Principal Surface and Manifold Learning

- Developed a new approach to find principal surface of given manifold by utilizing Runge-Kutta-4 algorithm.
- Proposed a novel speedup algorithm using Delaunay triangulation to detect principal surface and shorted the running time 20 times less.
- Architect novel statistical pattern recognition method for tracing of curvilinear structures. The solution unwraps manifold but preserves the local information.
- Applied the algorithm to medical digital images processing and brain signals.

Teaching Assistant at Virginia Tech, Blacksburg, VA

January 2014 – December 2014

Spring semester: ECE 3704 Continuous and Discrete System Theory

- Instructor: Dr. Ksw-Sur Tam

Fall semester: ECE 2504 Introduction to Computer Engineering

- Instructor: Dr. Devi Parikh

Professional Service

Student organizer for Conference Workshop

- Visual Question Answering (VQA) Challenge in CVPR 2016

Program Committee for Conferences

- Indian Conference on Computer Vision, Graphics and Image Processing (ICVGIP) 2014
- Indian Conference on Computer Vision, Graphics and Image Processing (ICVGIP) 2016

COMPUTER SKILLS

Matlab, C, Python, Caffe, Torch, Linux, MacOS, Windows, Latex, Git

PUBLICATIONS

P.Zhang^{*}, Y. Goyal^{*}, D. Summers-Stay, D. Batra, D. Parikh, Yin and Yang: Balancing and Answering Binary Visual Questions, *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2016

P. Zhang, J. Wang, A. Farhadi, M. Hebert and D. Parikh, Predicting Failures of Vision Systems, *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2014

P. Zhang, **E. Ataer-Cansizoglu**, **D. Erdogmus**, Local Linear Approximation of Principal Curve Projections, *IEEE International Workshop on Machine Learning for Signal Processing (MLSP)*, 2012

N. Ghadarghadar, E. Ataer-Cansizoglu, **P. Zhang**, D. Erdogmus, A SIFT-point Distribution-based Method for Head Pose Estimation, *IEEE International Workshop on Machine Learning for Signal Processing (MLSP)*, 2012