HANG ZHANG

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EDUCATION

Rutgers University Expected *Oct 2017*
Ph.D. in Electrical and Computer Engineering
Advisor: Prof. Kristin Dana
Research Interest: Computer Vision
Current GPA: 3.9/4.0

Southeast University (Nanjing, China) *June 2013*
B.S. in School of Automation
Advisor: Junyang - Li
Outstanding Undergraduate Thesis 2013 - School of Automation of Southeast University award for best thesis in the department.

EXPERIENCE

Amazon Lab 126 May 2017 - August 2017
Research Scientist Intern *Cupertino, CA*

· I will work with Dr. Ambrish Tyagi in Amazon Lab 126 during the summer.

Computer Vision Lab, Rutgers University January 2014 - Present
Graduate Research and Teaching Assistant *New Brunswick, NJ*

· Advisor: Prof. Kristin Dana

NVIDIA May 2016 - August 2016
Deep learning Research Intern *Holmdel, NJ*

· Autonomous Driving Group. Worked with Dr. Urs Muller.

Image Processing & Machine Vision Lab June 2012 - December 2012
Research Assistant *Nanjing, China*

· Monocular vision road recognition research based on the road surface texture features for complex urban roads. (Advisor: Prof. Junyang-Li)

TEACHING EXPERIENCE

Computer Architecture & Assembly Language Lab Spring 2016&17
Teaching Assistant

· Assisted in teaching Computer Architecture and Assembly Language Lab, including revising lab tutorials, managing course website, supervising the experiments and grading the lab reports.

Robotics & Computer Vision Fall 2014
Teaching Assistant

· Assisted in teaching the Robotics and Computer Vision class under the supervision of Prof. Kristin Dana. This course includes common computer vision techniques such as image transformations, RANSAC, camera calibration, motion detection, and face recognition.

PUBLICATIONS

1. Hang Zhang and Kristin Dana. Multi-style Generative Network for Real-time Transfer. *Under Review*, 2017
2. Hang Zhang, Jia Xue, and Kristin Dana. Deep TEN: Texture Encoding Network. *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2017
3. Jia Xue, Hang Zhang, Kristin Dana, and Ko Nishino. Differential angular imaging for material recognition. *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2017
4. Hang Zhang, Kristin Dana, and Ko Nishino. Friction from reflectance: Deep reflectance codes for predicting physical surface properties from one-shot in-field reflectance. In *European Conference on Computer Vision (ECCV)*, pages 808–824. Springer, 2016
5. Hang Zhang, Kristin Dana, and Ko Nishino. Reflectance hashing for material recognition. *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, pages 3071–3080, 2015

ON-GOING PROJECTS

Deep TEN: Texture Encoding Network CVPR 2017

We introduce the *Encoding Layer* built on top of the convolutional layers, which ports the whole dictionary learning and encoding pipeline into a single CNN layer. The Encoding Layer leverages the classic computer vision approaches and CNN framework, which makes the CNN architecture more flexible by allowing arbitrary input image sizes. In addition, the Encoding Layer learns an inherent dictionary and the encoding representation which is likely to carry domain-specific information and makes the learned convolutional features generic and easier to transfer. Our approach achieves state-of-the-art results on golden standard material/texture recognition datasets.

Differential Imaging for Material Recognition CVPR 2017

We build a large-scale material database, Ground Terrain in Outdoor Scenes (GTOS) database. The database consists of over 30,000 images covering 40 classes of outdoor ground terrain under varying weater and lighting conditions. We develop a novel approach for material recognition called a Differential Angular Imaging Network (DAIN) to fully leverage this large dataset utilizing angular and spatial gradients of appearance. Our results show that DAIN achieves recognition performance that surpasses single view or coarsely quantized multiview images.

MatCam Project ECCV 2016 & CVPR 2015

Reflectance offers a unique signature of the material but is challenging to measure and use for recognizing materials due to its high-dimensionality. We introduce a one-shot in-field reflectance capture and build compact binary reflectance code for fast retrieval. We demonstrate the effectiveness of reflectance hashing for material recognition with a number of real-world materials.

TECHNICAL AWARDS

Doctoral Consortium Travel Award (CVPR 2017) 2017
TA/GA Professional Development Fund Award (Rutgers) 2016
Outstanding Undergraduate Thesis Award (SEU, China) 2013
Phoenix Contact Fellowship (SEU, China) 2012

TECHNICAL STRENGTHS

Interested Area	Discriminative Visual Recognition, Deep Generative Model.
Programming Languages	C++, CUDA, Lua, Matlab, Python
Deep Learning Toolbox	Torch, PyTorch, Caffe, including backend programing

RELEVANT COURSE WORK

Fall 2015	COMPUTER ARCHITECTURE	(16:332:563)
	LINEAR ALGEBRA & APPLICATIONS	(16:642:550)
Spring 2015	CONVEX OPTIMIZATION	(16:332:509)
Fall 2014	PATTERN RECOGNITION	(16:198:535)
	PARALLEL & DISTRIBUTED COMPUTING	(16:332:566)
Spring 2014	ROBUST COMPUTER VISION	(16:332:570)
	SOFTWARE ENGINEERING II	(16:332:568)
	DATA STRUCTURE & ALGORITHMS	(16:332:573)
Fall 2013	MACHINE VISION	(16:332:561)
	PROGRAMMING FINANCE	(16:332:503)
	SYSTEM ANALYSIS	(16:332:501)