

ABHINAV SHRIVASTAVA

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University of Maryland, College Park

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EDUCATION

- Ph.D., Robotics, **Carnegie Mellon University** 08/2012 - 08/2017
Thesis: [Discovering and Leveraging Visual Structure for Large-scale Recognition](#)
Thesis Committee: [Abhinav Gupta](#) (chair), [Martial Hebert](#), [Deva Ramanan](#), [Alexei A. Efros](#), [Jitendra Malik](#)
Awarded Microsoft Research Ph.D. Fellowship (2014-16)
- M.S., Robotics, **Carnegie Mellon University** 08/2010 - 12/2011
Thesis: Data-driven Visual Similarity for Image Matching
Advisors: [Alexei A. Efros](#), [Martial Hebert](#)
- B.Tech., Computer Science & Engineering, **Jaypee Institute of Information Technology (JIIT)** 08/2006 - 05/2010
Major Project: A Hypermedia Development Tool for Movie-based Comic Strip Rendering
Awarded Vice Chancellor Gold Medal

WORK EXPERIENCE

- Assistant Professor, **University of Maryland, College Park** 08/2018 - *Present*
Department of Computer Science & UMIACS
- Visiting Research Scientist, **Google Research** 08/2017 - 08/2018
- Research Associate, **Google Research** 07/2016 - 07/2017
- Research Intern, **Microsoft Research** Summer 2015
- Research Intern, **Google Research** Summer 2013
- Research Intern, **Microsoft Research** Summer 2012
- Graduate Research Assistant, **Carnegie Mellon University** 2011 - 2017
- Research Associate III, **Carnegie Mellon University** Spring 2012

SELECTED AWARDS & HONORS

- Outstanding Reviewer Award, CVPR 2015
- Microsoft Research Ph.D. Fellowship 2014-16
- Best Student Paper Award, WACV 2014
- CNN's Top-10 Ideas of 2013 (Thinking Tech) ([link](#)) 2013
- CRA Research Highlight, Computing Community Consortium 2011
- Vice Chancellor Gold Medal (awarded to Rank 1 out of 120), JIIT 2010

ACADEMIC ACTIVITY & SERVICE

Program Committee & Reviewing:

- Conference Area Chair: CVPR'18, ECCV'18, CVPR'19
- Conference Reviewer: CVPR'12-17, ICCV'11-17, ECCV'12-16, NIPS'12-15, ACCV'12-14, SIGGRAPH'14, AAAI'15, 3DV'14-15
- Journal Reviewer: IJCV, TPAMI, CVIU, TKDE

University Activity:

Master's Admissions Committee, Robotics Institute, CMU	2015-16
Master's Thesis Committee, CMU: Shreyansh Daftry, Krishna Kumar Singh, Tanmay Batra	2014 - 2017
Ph.D. Qualifier Committee, CMU: Aayush Bansal, Ishan Misra, Xiaolong Wang	2015 - 2017

Teaching:

Introduction to Deep Learning: Spring 2019	2019-
Advanced Techniques in Visual Recognition and Learning: Fall 2018	2018-

Teaching Assistant:

Geometry-based Methods in Vision (16-822), CMU. (Instructor: Martial Hebert)	Spring 2013
Data Structures, IIIT	2008-09
Microprocessors and Controllers, IIIT	2008-09

PUBLICATIONS

Manuscripts under review

- [1] S. Singh and **A. Shrivastava**
EvalNorm: Estimating BatchNorm Statistics for Evaluation
In: under review, 2018
- [2] A. Bansal, S. S. Rambhatla, R. Chellappa, and **A. Shrivastava**
Detecting Human-Object Interactions using Functional Common-Sense
In: under review, 2018
- [3] C. Sun, **A. Shrivastava**, C. Vondrick, R. Sukthankar, K. Murphy, and C. Schmid
Relational Action Forecasting
In: under review, 2018
- [4] S. Singh, **A. Shrivastava**, S. Abu-El-Haija, J. Ballé, N. Johnston, and G. Toderici
Learning Compressible Features
In: under review, 2018

Peer-Reviewed Publications

- [5] C. Vondrick, **A. Shrivastava**, A. Fathi, S. Guadarrama, and K. Murphy
Tracking Emerges by Colorizing Videos
In: *European Conference on Computer Vision (ECCV)*, 2018
- [6] C. Sun, **A. Shrivastava**, C. Vondrick, K. Murphy, R. Sukthankar, and C. Schmid
Actor-centric Relation Network
In: *European Conference on Computer Vision (ECCV)*, 2018
- [7] C. Sun, **A. Shrivastava**, S. Singh, and A. Gupta
Revisiting Unreasonable Effectiveness of Data in Deep Learning Era
In: *IEEE International Conference on Computer Vision (ICCV)*, 2017
- [8] **A. Shrivastava**, R. Sukthankar, J. Malik and A. Gupta
Beyond Skip Connections: Top-Down Modulation for Object Detection
In: *arXiv*, 2017
- [9] X. Wang, **A. Shrivastava**, and A. Gupta
A-Fast-RCNN: Hard Positive Generation via Adversary for Object Detection
In: *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2017

- [10] **A. Shrivastava** and A. Gupta
Contextual Priming and Feedback for Faster R-CNN
In: *European Conference on Computer Vision (ECCV), 2016*
- [11] **A. Shrivastava** and A. Gupta
Training Region-based Object Detectors using Online Hard Example Mining
In: *IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2016*
Oral Presentation (3.9% oral acceptance rate) (4th place in MS COCO Detection Challenge)
- [12] I. Misra, **A. Shrivastava**, A. Gupta and M. Hebert
Cross-stitch Networks for Multi-task Learning
In: *IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2016*
Spotlight Presentation (9.7% spotlight acceptance rate)
- [13] I. Misra, **A. Shrivastava**, A. Gupta and M. Hebert
Watch and Learn: Semi-Supervised Learning of Object Detectors from Videos
In: *IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2015*
- [14] E. M. Aminoff, M. Toneva, **A. Shrivastava**, X. Chen, I. Misra, A. Gupta and M. J. Tarr
Applying Artificial Vision Models to Human Scene Understanding
In: *Frontiers in Computational Neuroscience, 2015*
- [15] X. Chen, **A. Shrivastava** and A. Gupta
Object Discovery and Segmentation via Discriminative Visual Subcategories
In: *IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2014*
- [16] I. Misra, **A. Shrivastava**, A. Gupta and M. Hebert
Data-driven Exemplar Model Selection
In: *IEEE Winter Conference on Applications of Computer Vision, 2014*
Oral Presentation, Best Student Paper Award
- [17] **A. Shrivastava** and A. Gupta
Building Parts-based Object Detectors via 3D Geometry
In: *IEEE International Conference on Computer Vision (ICCV), 2013*
- [18] X. Chen, **A. Shrivastava** and A. Gupta
NEIL: Extracting Visual Knowledge from Web Data
In: *IEEE International Conference on Computer Vision (ICCV), 2013*
Oral Presentation (2.52% oral acceptance rate), <http://neil-kb.com>
Popular Press: CNN (Top-10 Ideas 2013), Newsweek, Forbes, Yahoo! News, BBC News, AP, Business Insider, Slashdot, Engadget, Engadget, Techradar.
- [19] **A. Shrivastava**, S. Singh and A. Gupta
Constrained Semi-Supervised Learning using Attributes and Comparative Attributes
In: *European Conference on Computer Vision (ECCV), 2012*
Oral Presentation (2.8% oral acceptance rate)
- [20] **A. Shrivastava**, T. Malisiewicz, A. Gupta and A. Efros
Data-driven Visual Similarity for Cross-domain Image Matching
In: *ACM Transactions of Graphics, (SIGGRAPH Asia), 2011*
Oral Presentation (18% acceptance rate)
Popular Press: *TechCrunch, Y! Hacker News, Computing Community Consortium (Research Highlight of the week), Science Daily*

Invited Papers and Posters

- [21] **A. Shrivastava**, A. Gupta and A. A. Efros
Real-time Household Object Detection from First-person's view using Exemplar-SVMs
In: *IEEE Workshop on Egocentric Vision at CVPR, 2012* (Extended Abstract & Poster)

- [22] T. Malisiewicz, **A. Shrivastava**, A. Gupta and A. A. Efros
Exemplar-SVMs for Visual Object Detection, Label Transfer and Image Retrieval
In: *International Conference on Machine Learning (ICML), 2012*
(Invited Applications Talk + Extended Abstract)

Technical Reports

- [23] T. Zhou, **A. Shrivastava**, G. Obozinski, A. Gupta and A. A. Efros
Measuring and Increasing the capacity of Natural HOG Statistics
Technical Report, Carnegie Mellon University
- [24] I. Misra, **A. Shrivastava** and M. Hebert
HOG and Spatial Convolution on SIMD Architecture
Technical Report, Carnegie Mellon University

SELECTED TALKS, SEMINARS & LECTURES

Top-down Mechanisms in Bottom-up Deep Networks

Workshop on Deep Learning, University of Maryland, College Park, May 2017

The Small and the Rare: the Twin Menace of Visual Recognition

Colloquium: University of Maryland, College Park, Mar. 2017

GRASP Seminar: University of Pennsylvania, Feb. 2017

Training Region-based Object Detectors with Online Hard Example Mining

Conference: CVPR, Jun. 2016, [video](#)

NEIL: Extracting Visual Knowledge from Web Data

CMU VASC Seminar, Nov. 2013

Conference: ICCV, Dec. 2013, [video](#)

Guest Lecture (Course): Visual Recognition, University of Pittsburgh, Feb 2015

Constrained Semi-Supervised Learning using Attributes and Comparative Attributes

CMU VASC Seminar, Sep. 2012

Conference: ECCV, Oct. 2012, [video](#)

Guest Lecture (Course): Visual Recognition, University of Pittsburgh, Feb. 2015

Data-driven Visual Similarity for Cross-domain Image Matching

Conference: SIGGRAPH Asia, Dec. 2011

Guest Lecture (Course): Visual Recognition, University of Pittsburgh, Feb. 2015

Overview of Object Detection with historical context

Course: Learning Based Methods in Vision, CMU, Oct. 2013

Semantic vs Visual Subcategories in Computer Vision and Neuroscience

Course: The Visual World as seen by the Neurons and Machines, Mar. 2014

Building Part-based Object Detectors via 3D Geometry

CMU VASC Seminar, Nov. 2013

Tutorial on Caffe toolbox

Course: Big Data Approaches, CMU, Sep. 2014

Vanishing Point Estimation, and applications to Scene-layout Estimation

Guest Lecture (Course): Geometry-based Methods in Vision, CMU, 2013-16

Indexing in High-dimensional spaces (for large-scale nearest neighbor search)

Industry: Bing, Microsoft, Aug. 2012

Tutorial, CMU, Sep. 2012

Tutorial and Workshop on Automated Robotics (Micro-mouse)

Course: Microprocessors and Controllers, JIIT, 2008-09

Guest Lecture: Computer Society of India (CSI) Week, IGIT, IP University (India), 2008

Guest Lecture: IEEE Week, NIEC (India), 2008

Workshop: IEEE Winter Academic Program, JIIT, 2008

SELECTED MEDIA COVERAGE

Self-Supervised Tracking via Video Colorization	Google AI Blog; 2018
Revisiting the Unreasonable Effectiveness of Data	Google Research Blog; 2017
AI And 'Enormous Data' Could Make Tech Giants Harder to Topple	Wired; 2017
The Greatest Hits, and Misses, of an Image-Learning AI	Discover Magazine, 2015
Thinking Tech (Top-10 Ideas of 2013)	CNN, 2013
Computer Learns Common Sense From The Internet	Forbes, 2013
Watch out, WATSON. You've got competition	Newsweek, 2013
Computer uses images to teach itself common sense	BBC News, 2013
New research aims to teach computers common sense	Yahoo! News, 2013
Researchers Are Trying To Teach Computers Common Sense	Business Insider, 2013
New research aims to teach computers common sense	Associated Press (AP), 2013
CMU AI Learning Common Sense By Watching the Internet	Slashdot, 2013
Carnegie Mellon computer learns common sense through pictures, shows what it's thinking	Engadget, 2013
Meet NEIL, the computer that thinks like you do	Techradar, 2013
CMU Researchers One-Up Google Image Search & Photosynth With Visual Similarity Engine	Techcrunch, 2011
Computerized method for matching images in photos, paintings, sketches created	Science Daily, 2011
A better search for visually similar images	Y! Hacker News, 2011
CMU algorithm matches sketches, paintings to photographs	New Atlas (formerly Gizmag), 2011
Identifying Similar Images Across Domains, CRA Research Highlight	Computing Community Consortium, 2011

UNDERGRADUATE ACTIVITIES

Selected Robotics Competitions:

Finalists, Robo-Relay, IIT, Kharagpur	2008
Runner-up, Line Follower, Delhi College of Engineering	2008
Finalist, Maze Ablaze, Delhi College of Engineering	2008
Winner, Cross Terrain Racing, USIT, Indraprastha (IP) University	2007
Winner, Trash Collection, IGIT, Indraprastha (IP) University	2007
Runner-up, Chequered Flag, IGIT, Indraprastha (IP) University	2007

Selected Positions Held:

Technical Research Coordinator, Creativity and Innovation Cell in Robotics, JIIT	2008-09
Sun Campus Ambassador (for Sun Microsystems Inc.), JIIT	2008
President, JIIT Youth Club (student union), JIIT	2008-09
Team Leader, Microsoft Go-Alive Challenge, JIIT	2008
Treasurer, EBULLIENCE, JIIT	2007
Chief Project Coordinator, 2D Graphics (managing more than 800 students), JIIT	2007