

# Subhransu Maji

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## Research Interests

Computer vision, machine learning, and human-computer interaction

## Education

**Doctor of Philosophy**, with designated emphasis in “*Communication, Computation, and Statistics*”  
*Thesis*: Algorithms and Representations for Visual Recognition  
University of California at Berkeley, Berkeley, CA. 2006 – 2011. GPA: 3.96/4.0  
*Advisor*: Jitendra Malik

### **Bachelor of Technology**

Computer Science and Engineering Department  
Indian Institute of Technology, Kanpur, India. 2002 – 2006  
*Graduated top of the computer science department.* GPA: 3.96/4.0

## Employment/Academic Positions

**Toyota Technological Institute at Chicago**, Research Assistant Professor  
Chicago, IL, USA - since 01/2012 (current).

**University of Oxford**, Visiting Researcher  
Oxford, UK (Host: Prof. Andrew Zisserman/Andrea Vedaldi), Oct - Nov 2013

**Center of Language and Speech Processing**, Senior Member  
Johns Hopkins University, USA, June - Aug 2012

**University of California at Berkeley**, Graduate Student Researcher  
Berkeley, CA, USA, 2006 – 2011

**Google Inc.**, Summer Intern  
Image Search Group, Mountain View, CA, USA, May - July 2008 (Host: Chuck Rosenberg)

**Microsoft Research India**, Visiting Researcher  
Bangalore, India, May - June 2010

**LEAR group, INRIA Rhone Alpes**, Summer Intern  
Grenoble, France, May - July 2005 (Host: Cordelia Schmid)

## Awards and Fellowships

Best Poster Runner-up, in *Fine-Grained Visual Recognition Workshop, CVPR* 2013

Google Graduate Fellowship, 2008 – 2010

Honorable mention, PASCAL VOC Segmentation Challenge, 2010

Best Paper Award, in *International Conference on Information Fusion, ICIF* 2009

Department Fellowship, University of California at Berkeley, 2006 – 2007  
 Medal for graduating with the highest GPA in the CS Department, IIT Kanpur, 2006  
 Pratibha scholarship from Andhra Pradesh Govt., India, 2002 – 2006  
 Rajaraman scholarship for academic proficiency, IIT Kanpur, 2005  
 Academic excellence award, IIT Kanpur, 2002, 2003, 2004

## Student supervision

Ejaz Ahmed, PhD student at UMD (Intern w/ Greg Shakhnarovich), current  
 Rashmi V. Tonge, MS student at IIIT Hyderabad (Thesis co-supervisor w/ C.V. Jawahar), current  
 Mircea Cimpoi, PhD student at Oxford University (Co-supervised a project w/ Andrea Vedaldi), current  
 Catherine Wah, PhD student at UCSD, Intern, Feb - April '13, Jan'14 - current

## Teaching

Guest lect., Visual Recognition – "Visual Recognition using Poselets", TTI Chicago, Winter '12  
 Guest lect., CS294: Visual Search Engines – 'Methods for person detection', UC Berkeley, Fall'10  
 Guest lect., CS294: Visual Search Engines – 'Recognition using additive classifiers', UC Berkeley, Fall'10  
 Guest lect., CS 280: Computer Vision – 'Object detection using SVMs', UC Berkeley - Spring '10  
 GSI for CS 162, Operating Systems and Systems Programming, UC Berkeley, Fall '06  
 Organized and taught "Data Structures and Algorithms", Summer School, IIT Kanpur - 2006.

## Professional Activities

### **Tutorials/Workshops Co-organizing**

*Workshop* on "Human computation and computer vision", CVPR 2014  
*Workshop* on "Fine-grained Recognition Challenge", run in parallel with ILSVRC, ICCV 2013  
*Summer workshop* at the CLSP center, Johns Hopkins university on: *Towards a Detailed Understanding of Objects and Scenes in Natural Images*, June 11 - August 7, 2012, in collaboration with Andrea Vedaldi, Esa Rahtu, Matthew Blaschko, Iasonas Kokkinos and Ben Taskar.  
*Details can be found here:* <http://www.clsp.jhu.edu/workshops/archive/ws-12/groups/tduosn>  
*Tutorial* on "Computational Visual Recognition" at ICVGIP 2012, IIT Bombay  
<http://www.cse.iitb.ac.in/graphics/icvgip2012/tutorials.php>  
*Tutorial* on "Additive Kernels and Explicit Embeddings for Large-Scale Computer Vision Problems", ECCV 2012, Florence, Italy

### **Reviewing/Program Committee member**

Reviewer for the following international conferences: IEEE Conference on Computer Vision and Pattern Recognition (CVPR) 2009–2014, European Conference on Computer Vision (ECCV) 2010, 2012, International Conference on Computer Vision (ICCV) 2009, 2011, 2013, Conference on Neural Information Processing Systems (NIPS) 2010–13, Association for the Advancement of Artificial Intelligence (AAAI) 2012, International Conference on Machine Learning (ICML) 2012, 2013

Reviewer for the following international journals: IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI), International Journal of Computer Vision (IJCV), Computer Vision and Image Understanding (CVIU), IEEE Transactions on Image Processing (IP)

I have also been in the program committee member for various workshops organized at conferences including ECCV, CVPR and ICCV in the past several years.

## Research Talks

### **Rich Semantic Representations for Detailed Recognition**

TTI Chicago - 2014 ■ University of Minnesota, Twin-Cities - 2014, ■ University of Massachusetts - 2014 ■ Adobe, CTL, San Francisco - 2014 ■ Imperial College London - 2014 ■ Microsoft Research Cambridge - 2014

### **Discovering the Structure of Visual Categories from Human Annotations**

Robotics seminar, Oxford University, UK, 2013 ■ Microsoft Research Cambridge, UK, 2013 ■ Machine Learning Seminar, UMass Amherst, 2013 ■ Kyoto University, 2013 ■ Seminar, TTI Chicago, 2013 ■ Midwest vision workshop, TTI Chicago - 2013

### **Rich Representations for Detailed Recognition**

Vision/Graphics Lunch, UC Berkeley - 2013 ■ University of Southern California - 2013 ■ University of North Carolina, Chapel-Hill - 2013 ■ University of Maryland, College Park - 2013

### **Discovering a Lexicon of Parts and Attributes**

CLSP Summer Workshop, Johns Hopkins University - 2012 ■ Midwest vision workshop, UIUC - 2012 ■ *Workshop on Parts and Attributes*, ECCV, Florence - 2012 ■ Visipedia meeting, Caltech - 2012

### **Linearized Smooth Additive Classifiers**

Workshop on Web-scale Vision and Social Media, ECCV, Florence - 2012 ■ Tutorial on "Additive Kernels and Explicit Embeddings for Large-scale Computer Vision Problems", ECCV, Florence - 2012

### **Fast and Accurate Object and Action Detection**

Computer vision group, MIT - 2011 ■ Robotics Institute Seminar, CMU - 2011 ■ Google Research, Mountain View - 2011 ■ TTI Chicago - 2011

### **Recognizing Attributes and Actions of People**

Midwest vision workshop, TTI Chicago, USA - 2012 ■ Research at TTIC seminar, Chicago, USA - 2012 ■ Mysore park vision workshop, India, 2011

### **Large Scale Image Annotations using Amazon Mechanical Turk**

Intel Research, Berkeley - 2011 ■ RAD LAB seminar, Berkeley - 2011 ■ ML Tea, Berkeley - 2011

### **Max-margin Additive Classifiers for Detection**

Oral presentation at *International Conference on Computer Vision (ICCV)*, Kyoto, Japan - 2009

### **Max-margin Hough Transform for Object Detection**

Oral presentation at *Computer Vision and Pattern Recognition (CVPR)*, Miami, USA - 2009

### **Classification using Intersection Kernel SVMs is Efficient**

UC Berkeley computer vision seminar - 2009 ■ *Machine Learning Tea*, Berkeley - 2009

## Publications

Note: Conferences are the most important publication venue in computer vision. The conferences NIPS, ICCV, ECCV and CVPR have acceptance rates under 25%. In addition, several of these publications were oral presentations (under 5% acceptance at vision conferences). ICCV has a Citeseer impact factor in the top 5% of *all computer science publications* ranked. For the latest publications and citation counts see my Google scholar profile: <http://scholar.google.com/citations?hl=en&user=17Qx0zAAAAAJ>.

### *PhD Thesis*

#### **Algorithms and Representations for Visual Recognition**

University of California at Berkeley, December 2011

Advisor: Prof. Jitendra Malik

### *Journal Publications*

#### **Efficient Classification for Additive Kernel SVMs**

Subhransu Maji, Alexander C. Berg and Jitendra Malik

IEEE Transactions of Pattern Analysis and Machine Intelligence (PAMI), Volume 35 Issue 1, Jan 2013

#### **Poselets: A Distributed Representation for Visual Recognition**

Lubomir Bourdev, Subhransu Maji and Jitendra Malik

Journal of Vision, September, 23, 2011 vol. 11 no. 11 article 891

#### **Part and Attribute Discovery from Relative Annotations**

Subhransu Maji and Gregory Shakhnarovich

Accepted at International Journal of Computer Vision (to appear)

### *Refereed Conferences*

#### **Parsing World's Skylines with Shape Constrained MRFs**

Rashmi V. Tonge, Subhransu Maji, and C.V. Jawahar

CVPR 2014, Columbus, Ohio (to appear)

#### **Similarity Comparisons for Interactive Fine-Grained Categorization**

Catherine Wah, Grant Van Horn, Steven Branson, Subhransu Maji, Pietro Perona, and Serge Belongie

CVPR 2014, Columbus, Ohio (to appear)

#### **Understanding Objects in Detail with Fine-grained Attributes**

A. Vedaldi, S. Mahendran, S. Tsogkas, S. Maji, B. Girshick, J. Kannala, E. Rahtu, I. Kokkinos, M. B. Blaschko, D. Weiss, B. Taskar, K. Simonyan, N. Saphra, and S. Mohamed

CVPR 2014, Columbus, Ohio (to appear)

#### **Describing Textures in the Wild**

Mircea Cimpoi, Subhransu Maji, Iasonas Kokkinos, Sammy Mohamed, and Andrea Vedaldi

CVPR 2014, Columbus, Ohio (to appear)

#### **Active Boundary Annotation using Random MAP Perturbations**

Subhransu Maji, Tamir Hazan and Tommi Jaakkola

AISTATS 2014, Reykjavik, Iceland (to appear)

#### **Learning Efficient Random MAP Predictors with Non-Decomposable Loss Functions**

Tamir Hazan, Subhransu Maji, Joseph Keshet and Tommi Jaakkola

NIPS 2013, Lake Tahoe, Nevada

**On Sampling from the Gibbs Distribution with Random MAP Perturbations**

Tamir Hazan, Subhransu Maji and Tommi Jaakkola  
NIPS 2013, Lake Tahoe, Nevada

**Part Discovery from Partial Correspondence**

Subhransu Maji and Gregory Shakhnarovich  
CVPR 2013, Portland, Oregon

**Describing People: A Poselet-Based Approach to Attribute Classification**

Lubomir Bourdev, Subhransu Maji and Jitendra Malik  
ICCV 2011, Barcelona, Spain (oral presentation)

**Semantic Contours from Inverse Detectors**

Bharath Hariharan, Pablo Arbelaez, Lubomir Bourdev, Subhransu Maji and Jitendra Malik  
ICCV 2011, Barcelona, Spain

**Action Recognition from a Distributed Representation of Pose and Appearance**

Subhransu Maji, Lubomir Bourdev and Jitendra Malik  
CVPR 2011, Colorado Springs, Colorado

**Biased Normalized Cuts**

Subhransu Maji, Nisheeth Vishnoi and Jitendra Malik  
CVPR 2011, Colorado Springs, Colorado

**Object Segmentation by Alignment of Poselet Activations to Image Contours**

Thomas Brox, Lubomir Bourdev, Subhransu Maji and Jitendra Malik  
CVPR 2011, Colorado Springs, Colorado  
*Honorable mention in the PASCAL VOC 2010 segmentation challenge*

**Detecting People Using Mutually Consistent Poselet Activations**

Lubomir Bourdev, Subhransu Maji, Thomas Brox and Jitendra Malik  
ECCV 2010, Crete, Greece  
*Top performing person detector on the PACAL VOC 2009 – 2010 detection challenge*

**Max-Margin Additive Classifiers for Detection,**

Subhransu Maji and Alexander C. Berg  
ICCV 2009, Kyoto, Japan (oral presentation)

**Object Detection Using a Max-Margin Hough Transform**

Subhransu Maji and Jitendra Malik  
CVPR 2009, Miami, Florida (oral presentation)

**Multiple-View Object Recognition in Band-Limited Distributed Camera Networks**

Allen Y. Yang, Subhransu Maji, C. M. Christoudias, Trevor Darrell, Jitendra Malik and S. S. Sastry  
ICDSC 2009, Komo, Italy (oral presentation)

**Distributed Compression and Fusion of Nonnegative Sparse Signals for Multiple-View Object Recognition**

Allen Y. Yang, Subhransu Maji, K. Hong, P. Yan, Shankar S. Sastry  
ICIF 2009, Seattle, Washington (best paper award)

**Classification using Intersection Kernel SVMs is Efficient**

Subhransu Maji, Alexander C. Berg and Jitendra Malik  
CVPR 2009, Anchorage, Alaska  
*Fast and accurate evaluation of many non-linear classifiers used in computer vision*

**Confidence Based updatation of Motion Conspicuity in Dynamic Scenes**

Vivek Kumar Singh, Subhransu Maji and Amitabha Mukerjee

Computer and Robot Vision (CRV) 2006, Québec City, Canada

*Workshop Publications***Discovering a Lexicon of Parts and Attributes**

Subhransu Maji, Second International Workshop on Parts and Attributes, ECCV 2012 (oral presentation)

*Best poster runner-up at Fine-Grained Visual Recognition Workshop, CVPR 2013***Linearized Smooth Additive Classifiers**

Subhransu Maji, Workshop on Web-scale Vision and Social Media, ECCV 2012 (oral presentation)

**Part Annotations via Pairwise Correspondence**

Subhransu Maji and Gregory Shakhnarovich

4th Workshop on Human Computation, AAAI 2012 (oral presentation)

**Fast Unsupervised Alignment of Video and Text for Indexing/Names and Faces**

Subhransu Maji and Ruzena Bajscy

Multimedia Semantics Workshop, ACM Multimedia 2007, Augsburg, Germany

*Technical Reports and Preprints***Fine-Grained Visual Classification of Aircraft**

Subhransu Maji, Esa Rahtu, Juho Kannala, Matthew Blaschko and Andrea Vedaldi

CoRR arXiv:1306.5151, Submitted 21 Jun 2013. *This dataset will be a part of the Fine-Grained Visual Recognition Challenge, run in parallel with ImageNet classification challenge, ILSVRC 2013***Large Scale Image Annotations on Amazon Mechanical Turk**

Subhransu Maji, EECS Department, UCB, Tech. Rep. UCB/EECS-2011 – 79, July 2011

**Fast and Accurate Digit Classification**

Subhransu Maji and Jitendra Malik

EECS Department, UCB, Tech. Rep. UCB/EECS-2009 – 159, Nov. 2009

*Book Chapters***Multiple-view Object Recognition in Smart Camera Networks**

Allen Y. Yang, Subhransu Maji, M. C. Christoudias, Trevor Darrell, Jitendra Malik, Shankar S. Sastry

Distributed Video Sensor Networks, Springer, 2010

## Open-source Software

FIKSVM: Fast intersection/additive kernel SVM classification library

<http://ttic.uchicago.edu/~smaji/projects/fiksvm> · 5000+ visitors/year

Software of pose estimation/action recognition from images using poselets

<http://ttic.uchicago.edu/~smaji/projects/{action,3dpose}> · 2000+ visitors/year

A library written in C++/MATLAB to detect pedestrians in images

<http://ttic.uchicago.edu/~smaji/projects/ped-detector> · 1000+ visitors/year

LIBSPLINE: A library for training additive classifiers efficiently

<http://ttic.uchicago.edu/~smaji/projects/libspine-release1.0.tar.gz> · 500+ visitors/year

Software for interactive segmentation using normalized cuts

<http://ttic.uchicago.edu/~smaji/projects/biasedNcuts/> · 200+ visitors/year

Software for collecting annotations on Amazon's Mechanical Turk

<http://ttic.uchicago.edu/~smaji/projects/mturk> · 100+ visitors/year

## Publicly Available Datasets (These can be downloaded from my homepage)

Keypoint annotations of all the objects (20,000+) in the PASCAL VOC 2011 dataset

Semantic boundary dataset consisting on object boundaries on 11,000+ images

## References (Contact information available upon request)

Jitendra Malik, Professor, University of California at Berkeley

David A. Forsyth, Professor, University of Illinois Urbana Champaign

Andrew Zisserman, Professor, University of Oxford

Alexander C. Berg, Assistant Professor, University of North Carolina, Chapel-Hill

Cees G.M. Snoek, Associate Professor, University of Amsterdam, the Netherlands