

# Vidit Jain

University of Massachusetts Amherst  
Computer Science Department  
140 Governors Drive  
Amherst MA 01003

Tel: (413) 265 6130  
Fax: (413) 545 1249  
vidit@cs.umass.edu

<http://vis-www.cs.umass.edu/~vidit>

---

## Research Summary

I am broadly interested in computer vision, information extraction, and information retrieval. My research has been focused on developing data-driven probabilistic models for the next generation of context-aware face detection and recognition, recognizing free-form addresses, and evaluating generalization bounds for generative and discriminative methods for information retrieval.

## Education

Ph.D. Computer Science University of Massachusetts Amherst  
ongoing **Committee:** Erik Learned-Miller, Allen Hanson, James Allan, Andrew McCallum, Ramgopal Mettu

**Thesis:** *Collective and Joint Processing: Solving Difficult Cases in Face Detection and Recognition*

Focuses on face images that are difficult to detect and recognize due to extreme variations in factors such as pose, occlusion, and resolution. We propose computationally efficient ways to incorporate useful contextual cues in different stages of the recognition process. In particular, we use collective inference to share information across face regions within a single image, and joint probabilistic models to combine multiple computer vision models and different sources of information. We are developing a context-aware face recognition system using these modules.

M.S. Computer Science University of Massachusetts Amherst GPA 4.0/4.0  
2007 **Advisors :** Erik Learned-Miller, Andrew McCallum

**Thesis:** *Anchoring Topics to People using Face Recognition*

Jointly models people's identity, face appearance in an image, and surrounding text in the image captions with an LDA-style topic model. Improved results in identifying coherent sets of person "mentions" – that is, improved co-reference by using both text and image features.

B.Tech Computer Sci. and Engg. Indian Institute of Technology (IIT) Kanpur  
2002 **Advisor:** Manindra Agrawal

**Thesis:** *Analysis of Pseudo-random Permutations*

Proposes a new pseudo-random permutation generator based on a novel combination of DES and an existing pseudo-random number generator. Three statistical tests are designed to evaluate the pseudo-randomness of this permutation generator.

## Research Experience

- Aug'04-present      Computer Vision Lab, Univ. of Massachusetts      Amherst MA  
Research Assistant      Developing machine learning techniques for computer vision problems: a directed graphical model for multiple sources of information (ICCV'07), hidden-state conditional random fields for jointly solving related tasks (CVPR'08), discriminative training of hyper-feature models for object identification (BMVC'06), and unsupervised joint alignment of face images (ICCV'07) and 3D MRI volumes (IPMI'06).  
I am also studying the effect of training size, class imbalance, and distribution disparity on the generalizability of several approaches for information retrieval to evaluate the applicability of various results from statistical learning theory.
- June'09-Aug'09      Microsoft Research      Bangalore, India  
Intern      Evaluated the utility of click statistics for re-ranking image search results. (Supervisors: Manik Varma).
- June'07-Aug'07      ISRC, Kodak Research Labs      Rochester NY  
Intern      Proposed *selective hidden random fields* (CVPR'08) that simultaneously segment the object of interest in an image and use it for classification. We demonstrated the utility of this model for classifying the sporting event in personal photographs. (Supervisors: Amit Singhal and Jiebo Luo).
- May'06-Aug'06      Live Labs, Microsoft Research      Redmond WA  
Intern      Explored tree adjoining grammars for semi-structured web documents. We proposed an efficient approximate algorithm to parse these documents to recognize free-form addresses. (Supervisors: Mukund Narasimhan and Paul Viola).
- Jun'02-Aug'04      Read-Ink Technologies      Bangalore, India  
Technical Lead      Led a team of eight engineers working on building models for the lower case characters for an online cursive handwriting recognition system. My responsibilities involved design and implementation of this module and its integration with the overall system. I reported to the CTO of the company, Thomas O. Binford (Prof. Emeritus, Stanford University).
- May'01-Jul'01      Dept. of Computing Science, Umeå University      Umeå, Sweden  
Intern      Designed and implemented a parallel and distributed algorithm for determining cycle structures in very large permutations (of size  $\sim 2^{64}$ ) on a cluster of workstations. I further developed a pseudo-random permutation generator and related statistical tests as part of my under-graduate thesis. (Supervisor: Jop Frederik Sibeyn).
- Aug'00-Oct'00      Dept. of Computer Sci. and Engg., Indian Institute of Technology      Kanpur, India  
Project Fellow      Developed a prototype of a search engine for Indian languages using a variant of TRIE data structure. (Supervisor: T. V. Prabhakar).
- May'00-Jul'00      Graduate Admissions Office, Indian Institute of Technology      Kanpur, India  
Developer      Developed the software that has been used (since the year 2000) for conducting the Graduate Aptitude Test in Engineering (GATE), which is used for admission in graduate schools in India. I worked on the integration of scanning and printing devices, the algorithms for allocation of test centers and seats, and the management of records. (Supervisors: Rajat Moona and Pankaj Jalote)

# Publications

## Refereed

- Vidit Jain. *Naïve Bayes vs. Logistic Regression: An Assessment of the Impact of the Misclassification Cost*. To appear in NIPS'09 Workshop on the Generative and Discriminative Learning Interface, 2009.
- Vidit Jain, Amit Singhal, Jiebo Luo. [Selective Hidden Random Fields: Exploiting Domain Specific Saliency for Event Classification](#). In IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2008, Anchorage, AK. [*Acceptance rate: 27.9%*].
- Vidit Jain, Erik Learned-Miller, Andrew McCallum. [People-LDA: Anchoring Topics to People Using Face Recognition](#). In Proceedings of International Conference on Computer Vision (ICCV), 2007, Rio de Janeiro, Brazil. [*Acceptance rate: 23.6%*].
- Gary B. Huang, Vidit Jain, Erik Learned-Miller. [Unsupervised Joint Alignment of Complex Images](#). In Proceedings of International Conference on Computer Vision (ICCV), 2007, Rio de Janeiro, Brazil. [*Acceptance rate: 23.6%*].
- Vidit Jain, Andras Ferencz, Erik Learned-Miller. [Discriminative Training of Hyper-feature Models for Object Identification](#). In Proceedings of British Machine Vision Conference (BMVC), 2006, Edinburgh, UK. [*Acceptance rate: 28.8%*].
- Erik Learned-Miller, Vidit Jain. [Many heads are better than one: Jointly removing bias from multiple MRIs using nonparameteric maximum likelihood](#). In Proceedings of Information Processing in Medical Imaging (IPMI), 2005, Glenwood Springs, CO. [*Acceptance rate: 25.7%*].
- Vidit Jain, Marghoob Mohiyuddin, Phalguni Gupta. [Parallel Bi-dimensional Pattern Matching with Scaling](#). In Proceedings of IASTED Conference on Parallel and Distributed Computing Systems (PDCS), 2002, Boston, MA.

## Unrefereed

- Vidit Jain. *Collective and Joint Processing: Solving Difficult Cases in Face Detection and Recognition*. Dissertation Outline. Univ. of Massachusetts Amherst. 2009.
- Vidit Jain, Amit Singhal, Jiebo Luo, Erik Learned-Miller. *Exploiting Domain Specific Saliency for Event Classification*. Abstract in the Proceedings of Scene Understanding Symposium (SUNs) 2008, Boston MA.
- Vidit Jain, Allen Hanson, Erik Learned-Miller, Edward Riseman, Joseph Horowitz, Benjamin Liptzin. *A New Approach to Medical Resonance Imaging in Alzheimer's Disease*. Internal Report, Collaborative Biomedical Research Program, UMass Amherst and Baystate Health Systems, 2005.
- Vidit Jain, *Analysis of Pseudorandom Permutations*. Undergraduate thesis, IIT Kanpur, 2002.
- Vidit Jain, Jop Frederik Sibeyn. *Determination of Cycle Structure in Large Permutations: Parallel Implementation on a Cluster of Workstations*. Technical Report, UMINF-2001.27, Department of Computing Science, Umeå University, Umeå Sweden, 2001.

## Teaching Experience

Spring'09 Teaching Assistant	Introduction to Problem Solving with Computers using Java UMass Amherst Responsibilities include teaching weekly discussion sessions, holding office hours for helping students with Java-related issues, and grading assignments and exams. Gave a lecture on graphical user interfaces in Java.
Summer'02 Instructor	Data Structures and Algorithms IIT Kanpur Taught a course on data structures and algorithms to seniors and graduate students from science and engineering majors other than computer science.

## Honors and Awards

- Fellowship nominations:
  - Google PhD Fellowship (2009), Yahoo! PhD Fellowship (2008), Microsoft Research Fellowship (2005),
  - UMass Graduate School Fellowship (2005-2006).
- Travel awards:
  - IEEE PAMI-TC CVPR Travel Grant (2008), BMVA Bursary Award (2006).
  - UMass Graduate Council Travel Grant (2005).
- All-India Rank 54 in IIT Joint Entrance Examination'1998, 16 in Roorkee-JEE'98 (out of ~ 150,000).
- National Talent Search (NTS) Scholar, 1996-2002 (awarded by NCERT-India).
- Finalist (top four) in the National Technology and Science Olympiad at Techkriti'2001.

## Service Activities

- Reviewer for
  - (**Journal**) Transactions on Pattern Analysis and Machine Intelligence(PAMI), International Journal of Pattern Recognition and Artificial Intelligence (IJPRAI), Journal of Information Science and Engineering (JISE).
  - (**Conference**) IEEE Conference on Computer Vision and Pattern Recognition(CVPR'06, '07, '08, '09), International Conference on Computer Vision (ICCV'07), European Conference on Computer Vision (ECCV'06, '08), British Machine Vision Conference (BMVC' 08), International Conference on Computer Vision Theory and Applications (VISAPP'06), Neural Information Processing Systems (NIPS'06, '07), International Conference on Machine Learning (ICML'07).
- Publisher of [Indian Face Database](#) that is used by several research groups for evaluating face recognition methods, modeling face deformations for different emotions, and related psychological and behavioral studies.
- Organizer of [Machine Learning and Friends' Lunch](#) (Computer Science Department, UMass Amherst) 2006-2007: responsible for scheduling speakers, maintaining the website, and fund-raising and arranging food for the meeting.

- Substitute coach of the UMass programming team at ACM ICPC regional competition, 2008.
- Assistant Editor, Scholarpedia, 2008.
- Member of IEEE and British Machine Vision Association (BMVA).
- Member of New Student Committee (Computer Science Department, UMass Amherst) 2004-2006: involves organizing a visit weekend for accepted graduate students.
- Panelist for a discussion on Higher Education in India organized by the Indian Student Association, UMass Amherst.

## Invited Talks

- 2008 - *Mining Context for Recognizing People in Images*, Computer Science Department, University of Rochester.
- *Mining Context for Visual Person-Recognition*, Information Session for Research Experience for Undergraduates Program. UMass.
- 2007 - *Understanding Sports Images by Identifying and Characterizing the Playing Surface*, Kodak Research Labs, Rochester NY
- *People-LDA: Anchoring Topics to People using Face Recognition*, Machine Learning Friends' Lunch, UMass.