**Abhishek Nagar**
4630, S. Hagadorn Rd., Apt-B08
East Lansing, MI-48823
Phone: (517) 285-3592
Email: nagarabh@cse.msu.edu
www.cse.msu.edu/~nagarabh

## Education

**Ph. D.** **(2006-present)**
Computer Science and Engineering, Michigan State University

**M.Tech. (5-yr Integrated)** **(2001-2006)**
Mathematics and Computing, Indian Institute of Technology Delhi, India
Thesis: Biometrics based Cryptosystem Design GPA: 3.54

## Field of Interest

Biometric Recognition, Computer Vision, Machine Learning, Information Theory

## Employment

- Spring 2007-present: Research Assistant, CSE, MSU
- Fall 2006: Teaching Assistant, CSE, MSU
- Fall 2005-Spring 2006: Graduate Assistant, Maths, IIT Delhi
- May 2005-July 2005: Research Internship

Chair Pattern Recognition & Image Processing, University of Freiburg (Excellence University), Germany
Task: Development of a system for Selective combination of Visual Features using Relevance Feedback for Content-Based Image Retrieval.

- May 2004-July 2004: Research Internship

Department of Mathematics and Computer Science, Leipzig University, Germany
Task: Simulations for Phase Transitions in Elastic Many-Particle Systems.

- May 2003-July 2003: Research Internship

Department of Mathematics and Computer Science, Leipzig University, Germany
Task: Implementation of a Datastructure for Finite Volume Algorithms applied to Diffusion Systems.

## Research Publications

### Journal

1. A. K. Jain, K. Nandakumar and **A. Nagar**, "Biometric Template Security", EURASIP Journal on Advances in Signal Processing, Special Issue on Advanced Signal Processing and Pattern Recognition Methods for Biometrics, January 2008 (*invited*).

### Conferences

1. **A. Nagar**, K. Nandakumar, and A. K. Jain, Securing Fingerprint Template: Fuzzy Vault with Minutiae Descriptors", *Proc. Int'l Conf. on Pattern Recognition (ICPR)*, Dec., 2008. **(Best Scientific Paper Award in Biometrics Track)**
2. A. K. Jain, J. Feng, **A. Nagar** and K. Nandakumar, On Matching Latent Fingerprints, *IEEE Computer Society Workshop on Biometrics, CVPR*, Alaska, June 2008.

3. K. Nandakumar, **A. Nagar** and A. K. Jain, Hardening Fingerprint-based Fuzzy Vault Using Password, *Proc. 2nd Int'l Conf. on Biometrics (ICB)*, pp. 927 - 937, Seoul, South Korea, August 2007.
4. **A. Nagar** and S. Chaudhury, Biometrics based Asymmetric Cryptosystem Design Using Modified Fuzzy Vault Scheme, *Proc. Int'l Conf. on Pattern Recognition (ICPR)*, Vol. 4, pp. 537-540, Hong Kong, August, 2006.

**Technical Reports**

1. A. K. Jain, **A. Nagar** and K. Nandakumar, Latent Fingerprint Matching, MSU Technical Report, MSU-CSE-07-203, December 2007.

**Other Projects**

1. Whole hand image matching
   Designed techniques to robustly extract and match fingerprints, palmprint and hand shape from the whole hand image acquired using the multispectral sensor provided by Lumidigm. Different feature extraction, matching and score fusion algorithms were implemented to significantly improve the matching performance.

2. Deformation resilient fingerprint matching
   Designed technique to obtain point-by-point correspondence between fingerprints. Thin plate splines were used to remove the relative non-linear deformation among two matching fingerptints.

**Professional Experience**

1. Reviewer for Image and Vision Computing Journal, IET Signal Processing, Int'l Conf. on Biometrics (2008)
2. Student member IEEE, IEEE Computer Society
3. Teaching assistant for Computer Architecture-CSE 420 at MSU (Fall 2006). Responsibilities included conducting lab sessions and grading exams.

## Awards and Recognition

1. Awards received at Michigan State University
   a. First Prize (with Dr. Karthik Nandakumar) in the Department of Computer Science and Engineering Poster Workshop, April 2008. Poster Title: Biometric Template Security
   b. First Prize (with Dr. Karthik Nandakumar) in the Department of Computer Science and Engineering Poster Workshop, April 2007. Poster Title: Secure Biometric Authentication Using Fuzzy Vault
2. Awards received at annual convocation-2006, IIT Delhi
   a. Institute Silver Medal for highest GPA in Mathematics and Computing
   b. M. M. Chawla Gold Medal for session 2005-06
   c. Laxmi Bai-Lal Chand Khurana Memorial Award for session 2005-06
3. Various Merit Certificates for being in top 7% of the Institute in terms of GPA at IIT Delhi
4. Ranked 7th in the Punjab State Engineering College Entrance Examination.

## Computer Related Skills

Programming Languages: C, C++, Java
Packages: MATLAB

Operating Systems: Linux, Windows

**Relevant Courses**

**At MSU**
Pattern Recognition and Analysis, Information Theory, Error-correcting codes, Machine Learning, Modern Statistical Methods

**At IIT Delhi**
Digital Image Processing, Computer Vision, Statistical Methods and Algorithms, Algorithms in Mathematical Programming, Modern Algebra, Theory of Automata