

Sitaram Bhagavathy

Doctoral Candidate

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Objective

A full-time position that requires expertise in one or more of the following areas: computer vision, pattern recognition, image/video processing, image/video retrieval, statistical learning, data mining.

Education

Ph.D. in Electrical and Computer Engineering (expected September 2005)

University of California, Santa Barbara, CA

M.S. in Electrical and Computer Engineering, December 2000

University of California, Santa Barbara, CA

Cumulative GPA: 3.96

B.E. in Electronics and Communication Engineering, July 1999

National Institute of Technology (formerly Regional Engineering College), Surathkal, Karnataka, India

Experience

Graduate Student Researcher, Department of Electrical and Computer Engineering, University of California, Santa Barbara, CA, September 1999-June 2004. Advisor: Prof. B. S. Manjunath.

My primary research goal is modeling the appearance of high-level object classes, such as airports and harbors in geo-spatial images. These models are then applied to automating tasks such as object detection and segmentation. Furthermore, as a foundation for my primary goal, I have worked on a) compaction of the Gabor filter-based texture descriptor of MPEG-7 and efficient search using the same, and b) affine-invariant descriptors for shape contours. Please visit my website for further details.

Summer Intern, Mitsubishi Electric Research Laboratories, Cambridge, MA, June-September 2004. Hosts: Dr. Baback Moghaddam and Dr. Ajay Divakaran.

Designed and implemented a system to summarize and present large surveillance videos. The goal is to take a large surveillance video (hours or days long) and create a short summary that could be viewed in a few minutes. The summarization is based on statistically learning novel and typical behaviors of objects in the video. The system was designed to be customizable to the needs of the user.

Summer Research Fellow, Indian Institute of Science, Bangalore, India, July-August 1998. Advisor: Prof. K.R. Ramakrishnan.

Devised a method for automated recognition of hand-written Devanagari characters. The method uses Independent Component Analysis to decompose characters into a set of stroke-like features using which recognition is performed. This work was done at the Indian Institute of Science (IISc), through a summer research fellowship awarded by the Jawaharlal Nehru Center for Advanced Scientific Research (JNCASR), Bangalore, India.

Other Projects

SketchIt: Basketball Video Retrieval Using Ball Motion Similarity—Course project for “Multimedia Indexing” (CS 290I, Prof. Ambuj Singh)

Designed a prototype basketball video retrieval system with a query-by-sketch interface. Retrieval is based on the similarity of ball motion in a stored clip with that in the query. Trajectories are represented compactly by modeling ball motion as a set of parabolic trajectories. An R-tree is used to index these parabolic representations and search for similar trajectories in a low-dimensional parametric space.

A Wavelet-based Image Retrieval System—Course project for “Advanced Image Processing” (ECE 278A, Prof. B. S. Manjunath)

Proposed a wavelet-based weighted standard deviation content descriptor using which an image retrieval system was implemented. This descriptor is applicable to describing both texture and color (or a weighted combination thereof) in images.

Wavelet-based Multi-sensor Image Fusion—Course project for “Wavelets and Filter Banks” (ECE 594E, Prof. Sanjit K. Mitra)

Implemented a wavelet-based algorithm that fuses images from the same field of view but with different foci. The result is a single image with visibly better details.

Hand Gesture-driven Mouse Pointer—Senior-year Undergraduate Project (Prof. Sumam David)

Using a moment-based algorithm to recognize global hand pose, a real-time gesture recognition system was implemented. The practical objective was to move the mouse pointer in response to hand movement in front of a camera connected to the computer.

Computer Skills

Programming: C, C++, Visual C++, Java

Operating Systems: Windows 98/NT/2000/XP, Unix, Linux, Solaris, Irix

Other: Matlab, LaTeX, HTML, Perl

Honors and Activities

- Full financial aid for the entire period of graduate study (NSF-Alexandria digital library project, ONR).
- Teaching assistant for an undergraduate course on computer vision (ECE 181B, Spring 2001).
- Merit scholarship awardee for all four years of undergraduate study.
- Among the 75 students from all over India to receive the 1998 summer research fellowship awarded by the Jawaharlal Nehru Center for Advanced Scientific Research (JNCASR), Bangalore, India.
- Refereed papers for several journals and conferences, including PAMI, CSVT, CVPR, ICIP, and ICASSP.
- Former vice-president of the India Association of Santa Barbara (IASB), which has more than 400 members. Organized several large events in this capacity.

Publications

- [1] B. Sumengen, S. Bhagavathy, and B. S. Manjunath, "Graph Partitioning Active Contours for Knowledge-Based Geo-Spatial Segmentation," *CVPR Workshop on Perceptual Organization in Computer Vision (POCV)*, Washington DC, Jun 2004.
- [2] M. Zuliani, S. Bhagavathy, B. S. Manjunath, and C. S. Kenney, "Affine-Invariant Curve Matching," *International Conference on Image Processing*, 2004.
- [3] S. Newsam, L. Wang, S. Bhagavathy, and B. S. Manjunath, "Using Texture to Analyze and Manage Large Collections of Remote Sensed Image and Video Data," *Journal of Applied Optics: Information Processing*, vol. 43, Issue 2, Jan 2004, pp. 210-217.

- [4] S. Newsam, L. Wang, S. Bhagavathy, and B. S. Manjunath, "Using Texture to Annotate Remote Sensed Datasets," *Proceedings of 3rd International Symposium on Image and Signal Processing and Analysis*, Rome, Italy, Sep 2003, pp.72-77.
- [5] J. Tešić, S. Bhagavathy, and B. S. Manjunath, "Issues Concerning Dimensionality and Similarity Search," *Proceedings of 3rd International Symposium on Image and Signal Processing and Analysis*, Rome, Italy, Sep 2003, pp. 272-277.
- [6] S. Bhagavathy, J. Tešić, and B. S. Manjunath, "On the Rayleigh Nature of Gabor Filter Outputs," *International Conference on Image Processing*, Barcelona, Spain, Sep 14-17, 2003.
- [7] S. Newsam, S. Bhagavathy, and B. S. Manjunath, "Object Localization Using Texture Motifs and Markov Random Fields," *International Conference on Image Processing*, Barcelona, Spain, Sep 14-17, 2003.
- [8] S. Newsam, S. Bhagavathy, and B. S. Manjunath, "Modeling Object Classes in Aerial Images Using Hidden Markov Models," *International Conference on Image Processing*, Rochester, Sep 22-25, 2002.
- [9] S. Bhagavathy, S. Newsam, and B. S. Manjunath, "Modeling Object Classes in Aerial Images Using Texture Motifs," *International Conference on Pattern Recognition*, Quebec City, Aug 11-15, 2002.
- [10] S. Newsam, S. Bhagavathy, L.M.G. Fonseca, C. Kenney, and B. S. Manjunath, "Object-based Representations of Spatial Images," *Acta Astronautica*, vol. 48, no. 5-12, pp. 567-577, 2001.
- [11] K. R. Ramakrishnan, S. H. Srinivasan, and S. Bhagavathy, "The Independent Components of Characters are 'Strokes'," *International Conference on Document Analysis and Recognition*, pp. 414-417, Sep 1999.
- [12] S. Bhagavathy and M. El-Saban, "SketchIt: Basketball Video Retrieval Using Ball Motion Similarity," *Pacific-Rim Conference on Multimedia*, Tokyo Waterfront City, Japan, Nov 30-Dec 3, 2004.

References

(More references available on request)

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