

Arvind Bhusnurmath

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Education

Ph.D. Computer and Information Science, University of Pennsylvania, Spring 2008 (Expected)

M.S.E. Computer and Information Science, University of Pennsylvania, 2005

Integrated 5 year M. Tech in Mathematics and Computer Science, Indian Institute of Technology, New Delhi, 2002,

Teaching Experience

Teaching Assistant, undergraduate Calculus, Fall 2006. Handled 4 sets of recitations each comprising a group of around 10 students.

Teaching Assistant, undergraduate Discrete Mathematics, Fall 2005. Handled weekly recitations for a group of around 15 students.

Teaching Assistant, graduate Theory of Computation, Spring 2004. Responsibilities included grading and conducting office hours.

Teaching Assistant, undergraduate Computer Architecture, Fall 2003. Shared the responsibility of conducting the weekly recitation and held individual office hours.

Research Experience

Graph cuts using L1 norm minimization on a GPU

Work towards the final doctoral thesis. Presented a poster at the Penn Research Symposium. The graph cut problem is reduced to an unconstrained L1 norm minimization which can be implemented on a GPU. The current implementation is in CUDA, a programming language developed by NVIDIA for the GeForce 8800. An implementation is also provided in a combination of C++ and the Cg shader language.

Subpixel registration

Developed an algorithm that takes into account sampling problems to accurately register images for standard computer vision problems such as stereo correspondence and tracking. Worked in MATLAB on images taken of indoor textured scenes.

Ground plane detection for the LAGR project

The LAGR project aims at autonomous navigation of a robotic vehicle affixed with two stereo cameras and a GPS system. To aid the navigation, it becomes crucial to identify what is ground over the course of successive frames captured by the cameras. The ground plane was detected using a combination of feature point tracking and stereo correspondence algorithms. Handled the creation of the algorithm and the initial testing in MATLAB.

Finding feature points that can be efficiently tracked in a video sequence

Work done with Georges Quenot of CLIPS, Grenoble, France during a summer internship in 2001. Using a combination of feature detectors, points were selected for tracking over video sequences. The project was implemented in C. It involved 5 other collaborators and got published as a book chapter.

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Publications

Book Chapter : Recovering Camera Motion and Mobile Objects in Video Documents, Georges M. Quenot, Philippe Mulhem, Damien Paulin, Dinesh Kumar, Raghav Bhaskar and Arvind Bhusnurmath, In Chabane Djeraba, editor, Multimedia Mining: A Highway to Intelligent Multimedia Documents, pages 83-112. Kluwer, 2002.

Technical Reports

“Accurate Subpixel Registration in the presence of Photometric Scale and Bias,” with C. J. Taylor, MS-CIS-07-09, CIS department, University of Pennsylvania.

“Solving the Graph Cut Problem via L1 norm minimization,” with C. J. Taylor, MS-CIS-07-10, CIS department, University of Pennsylvania.

Work Experience

University of Pennsylvania Philadelphia, PA
PhD candidate 2002-Present
Conducted research in the field of Computer Vision under the supervision of Dr. C.J. Taylor.

CLIPS-IMAG Grenoble, France
Summer Intern May-July 2001
Conducted research and helped in the programming for Dr Georges Quenot’s project on feature point tracking using optic flow.

Technical Skills

Programming Languages - MATLAB, C, C++, OpenGL
GPU Programming - Cg, CUDA
Operating Systems - Windows, Linux
Calibration of Point Grey cameras

Service

Student member, IEEE
Reviewer for IROS 2007

Honors and Awards

Graduate Fellowship, Department of Computer and Information Science, UPenn.
Final project during the M.Tech in IIT declared as the best project in the mathematics department.

Activities

Volunteer for Philadelphia cares for the last 3 years. Teach reading skills to a 6 year old.
Volunteered as a food stamp screener in 2003 and 2004.

Personal Information

Nationality : Indian
Visa Status : F-1