Aroma Mahendru

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Current Position

Graduate Teaching Assistant and first semester student at Bradley Department of Electrical and Computer Engineering, Virginia Tech.

Education

2015- PRESENT — Master of Science in COMPUTER ENGINEERING
Specialization: Software & Machine Intelligence
Virginia Tech

2014 — Bachelor of Technology in ELECTRONICS ENGINEERING
Indian Institute of Technology BHU, Varanasi, India
GPA : 8.11/10 (ABSOLUTE SCALE)

2010 — All India Senior School Certificate Examination (Class XII)
SRDAV Public School Dayanand Vihar, Delhi, India
Subjects: Physics, Chemisitry, Mathematics, Computer Science (C++), English
PERCENTAGE: 95.2%

2008 — All India Secondary School Examination (Class X)
DAV Public School Dayanand Vihar, Delhi, India
PERCENTAGE: 92.2%

Work Experience

OCTOBER 2014- JUNE 2015 — Research Assistant
Machine Learning and Perception Lab, Virginia Tech

Skills and Interests

Languages :C++, Python, C, Java, Verilog HDL, HTML
Technologies :Matlab, OpenCV, Graphlab, Visual Studio, Code Composer Studio, Xilinx.
Interests :Research and software development in machine learning and computer vision.

Research Projects

OCTOBER 2014 - JUNE 2015 — **Object Proposals: Bias in Evaluation Protocol**
Machine Learning and Perception Lab, Virginia Tech

Object proposals generators are now part of all efficient detection methods. However, the evaluation protocol for such methods is flawed in some ways. In this project, we have compiled a toolbox and conducted experiments to unveil the same. The research was submitted as a paper to arXiv. This project was supervised by Dr. Dhruv Batra (Assistant Professor, ECE Department, Virginia Tech).

August 2013 - May 2014 **Robust Reading in Scene Images** (Bachelor Thesis)
Indian Institute of Technology BHU, Varanasi

The aim was to localize and recognize text from urban scene images.Localization has been implemented using standard image processing techniques.Implementing text verification step algorithms based on simple text characteristics. Recognition is executed using bag of visual words approach. I was advised by **Dr. RR Das** (Professor, Electronics Engineering, IIT BHU).

September- January 2013 **Implementation of Bethe ADMM and modeling budget factors for AD3**
Machine Learning and Perception Lab, Virginia Tech

Bethe ADMM is one of subgradient based MAP inference algorithms. It is faster as comparedto regular ADMM as it computes marginals using a sum-product belief propagation. The aim of this project is to implement Bethe ADMM for the distributed API Graphlab. To use higher order cardinality based potentials vertices which could be modeled as budgets were also implemented. This project was supervised by Dr. Dhruv Batra and Dr. André Martins (Research Scientist, Priberam Labs Lisbon, Portugal)

May- July 2013 **Implementation of Dual Decomposition and AD3 in Graphlab API** (Summer Internship)
Machine Learning and Perception Lab, Virginia Tech

MAP Inference algorithms are at core for solving almost all computer vision problems. Due to huge size of graphs in practical problems, distributed computation becomes necessary. In this project, symmetric and projected dual decomposition, alternating directions dual decomposition was implemented on a parallel framework Graphlab. This project was also supervised by Dr. Dhruv Batra and Dr. André Martins.

May- July 2012 **Classification and Shape Detection of Transparent Objects** (Summer Internship)
Indian Institute of Technology, Delhi

Detecting transparent object is a tricky problem in Computer Vision.In this project, by leveraging the specular reflection property of transparent objects and hence using polarization images, an algorithm was successfully developed to classify transparent objects from opaque objects. This was presented as a paper in Sixth International Conference on Sensing Technology 2012. I was advised by Dr. Mukul Sarkar (Assistant Professor, Electrical Engineering, Indian Institute of Technology, Delhi) for this project.

Other Projects

- Co-ordinated machine learning based event Monudex (Monument classification problem) in Aayam'13, technical festival of Dept of Electronics Engg , IIT BHU.
- Modeled working semi autonomous microcontroller (Atmega 16) based robot to diffuse 'mines' while traversing shortest path for Technex'11, technical festival of IIT BHU.
- Modeled autonomous microcontroller (Atmega 16) based robot to find path through a maze on the basis of color for Technex'11, technical festival of IIT BHU.

Achievements

- Accepted to MS Robotics program at Robotics Institute, Carnegie Mellon University.
- Received 2nd Prize in Undergraduate category in 2013 IIT-BHU Publication Awards for demonstrating publication record amongst IIT BHU BTech/MTech/IDD students.
- Qualified IIT-JEE with All India Rank 2742.(About 8000 out of 500,000 candidates qualify IIT-JEE.)
- Received 0.1 merit certificate for C++ computer science course for scoring amongst 0.1 percent candidates in CBSE board examination.
- Received highest consistency award in school (secured 90% and above in classes VI-XII)

Links

- Graphical Models Toolkit Graphlab [Code]
- Object Proposals paper [Publication]
- Robust Reading in Scene Images [Report]
- Bio-Inspired Object Classification using Polarization Imaging [Publication]