Aseem Saxena

Personal Data

Place and Date of Birth:	Delhi, India | 24 April 1993
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Work Experience

August 2017 - Current

Research Assistant at M2AP, National University of Singapore, Singapore
QMDP-Net: Deep Learning for Planning under Partial Observability

- I created a full fledged GUI Visualizer using Python Tkinter Library to understand the QMDPnet algorithm. I visualize various components of a POMDP such as reward map, belief and value function to get an intuition on how the algorithm works.

April 2017 - July 2017

Research Assistant at Robotics Research Center, International Institute of Information Technology, Hyderabad, India
Traffic Sign Detection, Recognition and Tracking
Mahindra Driverless Car Challenge

- Workedvon developing a robust system for traffic sign detection, recognition and tracking as a part of the Mahindra Driverless Car Challenge. Keywords - Deep Learning

July 2016 - April 2017

Computer Vision Engineer at Ducere Technologies Pvt Ltd Hyderabad, India
Indigenous low cost LiDAR system

- Worked on developing a low cost LiDAR system using a Teraranger One ToF sensor on a pan tilt unit for 3D scanning.

Vision for the blind

- Tinkered with various depth perception techniques such as structured light, stereo, ToF for implementing basic obstacle detection for a visually challenged person. Keywords: Intel Realsense, Teraranger One ToF

December 2016 - Current

Active Participant at Stanford Scholar Initiative

- Led and actively participated in the creation of research talks on influential research papers viz. Deep Residual Learning, FRAUDAR, Rovables, Real-Time 3D Reconstruction and 6-DoF Tracking with an Event Camera and Bayesian Active Learning for Posterior Estimation.

June 2015- July 2016

Research Assistant at Robotics Research Center, International Institute of Information Technology, Hyderabad, India

Supervisor : Dr. K. Madhava Krishna

Exploring Convolutional Networks for End-to-End Visual Servoing

Video

Code

Accepted at IEEE ICRA 2017

We present an end-to-end learning based approach for visual servoing in diverse scenes where the knowledge of camera parameters and scene geometry is not available apriori. This is achieved by training a convolutional neural network over color images with synchronised camera poses.

Guess from Far Recognise when Near

Video Link: Guess from Far Recognise when Near

Object recognition is achieved using 3-D Point Cloud data from Kinect sensors and constructing a Bag of Words Model on it. It is trained using a Support Vector Machine Classifier. Object Detection is achieved using segmentation of 2-D images by Markov Random Fields. The implementation is done on a Turtlebot with a Kinect Sensor mounted on top of it.

Deep Learning for Table Interest Point Detection

Report: Deep Learning for Table Interest Point Detection

I attempt to find interest points or corner points of tables in a scene using cues from semantic segmentation and vanishing lines. Availability of semantic information such as interest points can help mobile robots navigate in a better way.

Automating GrabCut for Multilabel Image Segmentation

Report: Automating GrabCut for Multilabel Image Segmentation

Performing Image Segmentation for 3 labels without user guidance by learning a GMM for each label and performing alpha expansion algorithm using MRF2.2 Library.

SUMMER 2014 — Research Intern at STRAND LIFE SCIENCES PVT. LTD., Bangalore, India

Supervisors : Dr. Vamsi Veeramachaneni and Mahesh Nagarajan

Somatic Germline Classification using Decision Trees

- Applying Decision Trees and Support Vector Machines and other classification algorithms to biological data.
- Predict if a certain mutation was cancer induced without having any knowledge of the cancer tissue beforehand by training the model with existing data.
- Python for file handling, data cleaning and data preparation.
- R for applying Classification Algorithms.

EDUCATION

MAY 2016 — Master of Science in BIOLOGICAL SCIENCES,
Birla Institute of Technology and Science,
Pilani, Rajasthan, India
CGPA: 7.34/10

MAY 2016 — Bachelor of Engineering in ELECTRICAL AND ELECTRONICS ENGINEERING,
Birla Institute of Technology and Science,
Pilani, Rajasthan, India
CGPA: 7.34/10

APRIL 2011 — Class 12th, **Cambridge School**, Noida, Uttar Pradesh, India
MARKS: 90.6/100

APRIL 2009 — Class 10th, **Cambridge School**, Noida, Uttar Pradesh, India
MARKS: 91.8/100

Scholarships and Certificates

2011 Kishore Vaigyanik Protsahan Yojana Fellowship
Department of Science and Technology, Government of India.
2010 All India Rank 1 in National Cyber Olympiad, 2010.

Skills

Deep Learning	Caffe, Torch
Computer Vision	OpenCV, Point Cloud Library
Robotics Platforms	Robot Operating System (ROS)
Programming Languages	C/C++, JAVA, Python, MATLAB, R.
Robots Worked on	Turtlebot Robots, e-PuckRobots, FireBird V Robots, Parrot Bebop 2.
Audio and Video Editing	Cubase, KdenLive.
Miscellaneous	Simulink, Verilog HDL, Proteus, MASM.

Academic Projects

OBJECT AVOIDANCE ON FIREBIRD V AND E-PUCK ROBOTS : I implemented various object avoidance algorithms in C++ such as bug-0, bug-1 on the FireBird V and e-puck robots and tested it on a variety of obstacles.
PROBLEMS IN CURRENT BEST MODEL ASSESSMENT MEASURES : I worked on protein structure prediction and different drawbacks of current metrics being used and hypothesizing own metrics to solve current problem.
APPLICATION OF GENETIC ALGORITHMS IN ROBOT LOCOMOTION : Conceptualization of a robot with different interchangeable modules which can climb a stair using genetic algorithms for optimizing sequence of motion.
miRNA EXPRESSION PROFILING of LIVER HEPATOCELLULAR CARCINOMA : I worked on modelling of miRNA data. I calculated differential expression using Volcano Plots.
SOBRIETY CHECKER USING INTEL 8086 MICROPROCESSOR : I made a virtual sobriety checker on Proteus and MASM using Intel 8086 microprocessor, Timer, Buttons and LEDs to calculate response time between two button presses.

Extra curricular Activities

Member of INSPIRE robotics lab at BITS Pilani.
Guitarist, Bassist, Vocalist and Keyboardist at Music Club BITS Pilani.
Avid Marathon runner; Regularly participate in Full Marathons.
Keen Swimmer; Awarded Silver in Inter Hostel Swimming competition.