

BHAVAN JASANI

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EDUCATION

Carnegie Mellon University, School of Computer Science

Pittsburgh, PA

M.S. in Robotics (Research based) / CGPA: 3.89/4.0

August 2017 – June 2019 (expected)

Courses: Computer Vision, Machine Learning, Visual Learning & Recognition, Deep Reinforcement Learning & Control, Advanced Multimodal Machine Learning, Robot Localization & Mapping

Birla Institute of Technology & Science (BITS), Pilani – K.K. Birla Goa Campus

Goa, India

Dual degree: M.Sc. Physics + B.E. Electrical & Electronics Engineering / CGPA: 9.32/10

August 2011 – August 2016

SKILLS

Python, C, TensorFlow, PyTorch, Scikit, OpenCV, MATLAB, AWS, ELAN, ROS, PCL, MeshLab

RESEARCH EXPERIENCE

Carnegie Mellon University, Robotics Institute, School of Computer Science

Pittsburgh, PA

Research Assistant (*under Prof. Jeffrey Cohn and Dr. Laszlo Jeni*)

October 2017 – present

- Building multi-modal (video + audio) emotion recognition system on noisy real time annotated data which has variable temporal lag between the video segments and the corresponding annotated emotion labels
- Extracting 3D facial landmarks (by 3D face alignment from 2D videos), head pose, body pose and facial action units; using models which take time series of these features and deep learning models based on RNN's and CNN's
- Finding and quantifying the influence of head movements, facial expressions (Facial Action Units) and body pose on behaviour of people in interpersonal conversations

Nanyang Technological University, School of Computer Science & Engineering

Singapore

Research Staff [Publications - [paper 1](#), [paper 2](#), [paper 3](#)]

August 2016 – May 2017

- Implemented parallel and hardware efficient (requires 40% less hardware resources) object detection algorithm for real time, pedestrian detection system on embedded system (Altera FPGA and Terasic camera)

Internship (*part of bachelor's thesis*)

January 2016 – July 2016

- Developed a novel approach for hardware acceleration by finding optimal bit-width, results in 45% reduction of bit-width of Harris Corner Detector with just 0.57% decrease in accuracy, and runs at high fps (335) on HD videos [[thesis report](#)]

PROJECTS

Deleting 3D Objects in Augmented Reality using ORB-SLAM

March 2019 - present

- Combining 2D image segmentation from Mask RCNN with point cloud generated by from ORB-SLAM

Discovering biases in Visual Question Answering (*independent study course under Prof. Deva Ramanan*)

May – Dec 2018

- Discovered and quantified language biases in video based visual question answering datasets and how deep networks learn to cheat, proposed adversarial ways to mitigate these language biases to make visual information useful
- Exploited these biases to develop a simple model which only looks at the question, and yet achieves state of the art accuracy on leader board of MovieQA dataset [[under review ICCV 2019](#), [details](#)]

Zero-shot Learning for Action Recognition

April – June 2018

- Built a zero-shot body pose based action recognition system (in PyTorch), which learns joint semantics between word embeddings of class labels and the video features extracted from a spatio-temporal graph convolutional network (STGCN)
- STGCN takes time series of body pose of the action performer as the input & learns pose representation [[details](#)]

Domain Adaptation for Image Classification:

March – May 2018

- Taking the predictions of a source domain trained network on target domain data as noisy labels
- Implemented a RL agent which learns a policy to sample from this data for training a new classifier for target-dataset, to maximize the classification accuracy of a small annotated partition (that acts as reward) of the target-dataset [[link to paper](#)]

Adversarial Image Generation using GAN's

November 2017

- Implemented a generative adversarial network (GAN) in TensorFlow for generating adversarial images which can fool a neural network (black box attack) for CIFAR 10 dataset [[details](#)]

Distracted Driver Detection

May – July 2016

- Implemented a fast RCNN based neural network for classifying the state of driver from images taken from car's dashboard camera facing the driver, for State Farm Distracted Driver Detection competition hosted on Kaggle

SELECTED PUBLICATIONS

- Are we asking the right questions in MovieQA? Understanding language biases in Visual Question Answering
 - State of the art accuracy on 4 out of 5 categories on MovieQA leader board [**under review ICCV 2019**, [details](#)]
- Learning sampling policies for domain adaptation of image classifiers, [arXiv:1805.07641](#)
- Threshold-guided design and optimization for Harris corner detector architecture, [IEEE Transactions On Circuits and Systems For Video Technology](#)
- Data-path unrolling with logic folding for area-time-efficient FPGA-based FAST corner detector, [Journal of Real-Time Image Processing](#)

AWARDS & ACHIEVEMENTS

- **DAAD WISE 2014 scholarship**, awarded by German Academic Exchange Service for summer research internship at a German research institution
- **Innovation in Science Pursuit for Inspired Research (INSPIRE) 2011 – 2016**, fellowship from Department Of Science And Technology, Government of India, awarded to bright students majoring in sciences