Asim Unmesh

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Education

2013- **Integrated B.Tech M.Tech**, *IIT Kanpur*.
PG GPA: *8.0/10.0*

2013 **AISSCE , CBSE**, *Bosco Public School*.
94.2%

Research Experience

May 2016-July 2016 **Research Intern**, *Purdue University*, Indiana, USA, 3D reconstruction.
3D reconstruction of Rigid and Non Rigid Objects from RGB or RGBD images using Deep Learning *[In the proceedings of CVPR 2017]*

- Successfully reconstruct shapes of Pascal 3D dataset's rigid object categories from their images.
- Successfully reconstruct non rigid Objects (human hand) from their images.
- Additionally, perform shape interpolation by varying the parameters used by the "decoder" network.

Oct 2017 - **Collaborative Research**, IIT Kanpur, Active Learning .
Active Learning for Deep Learning based Object Detection *[To appear in the proceedings of BMVC 2018]*

- Active Learning methods on Single Shot Detector(SSD)
- Methods query dataset using disagreement between different layers of SSD. Inspired by the method of Mixture of Experts.

Publications

2017 **CVPR 2017**.
SurfNet: Generating 3D shape surfaces using deep residual networks
Ayan Sinha, Asim Unmesh, Qixing Huang, Karthik Ramani

2018 **BMVC 2018**.
Deep Active Learning for Object Detection
Soumya Roy, Asim Unmesh, Vinay P. Namboodiri

2017 **BESC 2017**.
Agent Based Simulation of Evolution of Society as an Alternate Optimization Problem
Amartya Sanyal, Asim Unmesh, Sanjana Garg

Relevant Projects

Jan 2017-May 2017 **Course Project, Natural Language Processing**, *Question Generation from texts using Deep Learning*. .

- Implemented from scratch "Learning to Ask: Neural Question Generation for Reading Comprehension" by Du et al on PyTorch Deep Learning Framework.

Jan 2017-May 2017 **Course Project, Probabilistic Modeling and Inference**, *LDA on documents with meta data information*.

- A method to learn topics from a corpus with metadata information inspired by Latent Dirichlet Allocation.
- Proposed an inference approach using Stochastic Gradient Riemannian Langevin Dynamic
- Implemented the approach from scratch on Python using basic libraries such as NumPy.

July 2017-December 2017 **Course Project, Game Theory and Mechanism Design**, *Mechanism for auctioning and allocation in a multi agent setting*.

A mechanism for "fair" auctioning and allocation in a multi agent setting such as a Food Market.

- Formulated a "fair" mechanism for allocation in the multi agent setting of Food Market.
- Implemented and Simulated the Mechanism using SymPy library, with live visualisation support.

Jan 2017-May 2017 **Course Project, Multi Agent Systems**, *Simulation of Evolution of Society using an alternate optimization formulation*.

- Formulated evolution of society as a game between individual agents and a collective super agent.
- Updates are made using an alternate optimization scheme.
- Simulated this formulation using SymPy framework on Python.

July 2017-December 2017 **Course Project, Visual Recognition**, *Occlusion Edge detection from RGB images*.

- Developed a deep learning based system to identify occlusion edges in an RGB image.
- Used RGBD images from NYU v2 dataset to create a dataset for occlusion edge mask generation task.
- Implemented and trained a Deep Convolutional Neural Network for this task using Tensorflow.

Other Projects

Jan 2017 - May 2017 **Compiler Design, Course Project**, *Scala Compiler*.

- Implemented a Compiler for some features of Scala Language for MIPS architecture.

July 2015 - December 2015 **Machine Learning Tools and Techniques, Course Project**, *Pedestrian and Vehicle Detection*.

- Used Deep Learning for detecting pedestrians on an IIT Kanpur dataset.

Jan 2015 - May 2015 **Fun Project**, *Virtual Reality*.

Android app demonstrating Virtual Reality.

- Created a 3D indoor environment and used Google Cardboard library to render a Virtual Reality experience on smart phones.

Teaching experience

Jan 2018 - May 2018 **Teaching Assistant**, *Fundamentals of Computing*.

Scholastic Achievments

KVP 2012 AIR 237

RMO 2010 Regional Rank 15

JEE Advanced 2013 AIR 634

Technical Skills

Languages C, C++, Python, Bash, Matlab, LaTeX

Frameworks Tensorflow, PyTorch, Caffe, Keras

Relevant Coursework

Machine Learning Tools and Techniques, Introduction to Computer Vision, Recent Advances in Computer Vision, Introduction to Natural Language Processing, Probabilistic Modeling and Inference, Game Theory and Mechanism Design, Visual Recognition, Multi Agent Systems, Game theory and Mechanism Design