Nirbhay Modhe

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EDUCATION

Georgia Tech, PhD in Computer Science — 2017-present

IIT Kanpur, B. Tech in Computer Science, CGPA: 9.7/10 — 2013-2017

PUBLICATIONS

Vikas Jain*, **Nirbhay Modhe***, Piyush Rai. Scalable Generative Models for Multi-label Learning with Missing Labels. *International Conference on Machine Learning (ICML),* 2017 — Feb 2017

RESEARCH EXPERIENCE

Georgia Tech, Prof. Dhruv Batra & Prof. Devi Parikh — Aug 17' - Nov '17
Towards Smarter Q-Bots in Visual Dialog — **(video , pres)**

- Explored ways of making the Questioner Bot ask more discriminative questions in the visual dialog task where two agents play a cooperative image-guessing game

IIT Kanpur, *Prof. Amitabha Mukerjee* — May '15 – August '15
Reconstructing Unique Inversions for Deep Model of Motion — **(report)**

- Extended the Convolutional Chair Generation model by Dosovitsky et. al. for reconstructing poses of a 3 DOF robotic arm.
- Obtained a labelled dataset of the CRS Robot Arm using 6 cameras and used the proposed CNN to learn the robot image representations.

IIT Kanpur, *Prof. Raghunath Tewari* — Dec '15 - April '16
Probabilistic Polynomial Method in Circuit Complexity — **(pres , report)**

- Studied the application of the probabilistic polynomial method by Ryan Williams in the All Pairs Shortest Path and Boolean Orthogonal Detection problem.
- Proposed the application of this method to solve min-plus matrix multiplication faster by using the tensor product decomposition of the two matrices.

INTERNSHIPS

SRI International, Giedrius Burachas — May 18' - August '18
Stochastic Video Prediction for Navigation

- Applied disentangled representations for stochastic video prediction in a virtual Unity3D environment and the KITTI dataset.

University of Texas at Dallas, *Prof. Vincent Ng* — May '16 - July '16
Event Coreference Resolution

- Explored the use of recurrent neural networks for event coreference resolution

OPEN SOURCE

VisDial-RL in PyTorch, Prof. Dhruv Batra — July '18
batra-mlp-lab/visdial-rl

- Lead the open source project for implementing VisDial RL - *Learning Cooperative Visual Dialog Agents using Deep Reinforcement Learning* by Das and Kottur et. al., 2017, in PyTorch.

TEACHING EXPERIENCE

Fundamentals of Computing, Tutor — *Semester I and II, 2016-17*

- Taught in weekly tutorial classes, devised and graded lab exams, supervised weekly lab sessions, for two consecutive semesters.

Fundamentals of Computing, Academic Mentor, Counselling Service — *2014-15*

- Mentored academically deficient students in the course ESC101 (Fundamentals of Computing) through personal tutoring and doubt clearing sessions.

COURSE PROJECTS

Generative Image Modelling using DRAW July '16 - November '16
Recent Advances in CV, Prof. Gaurav Sharma **(code , pres , report)**

- Analysed the generative RNN model "DRAW" by Gregor et. al. by experimenting with the parameters and design choices of the enocder-decoder framework on the MNIST and Street View House Numbers (SVHN) cropped dataset.
- Implemented and evaluated three new modifications to DRAW which incorporate convolutional features, supervised learning and fully convolutional networks on the MNIST dataset.

Image Colorization by Patch Inference Jan '16 - April '16
Computer Vision, Prof. Vinay Namboodiri **(code , poster , report)**

- Implemented and evaluate a novel image colorization model inspired by the idea of "Fast Direct Super-resolution by Simple Functions" by Yang et. al. The model learns to color images by training on the luminance and chrominance values of local patches.
- Evaluated the model on a set of scene images from the Sun Database.

Word Sense Disambiguation in Hindi March '15 - April '15
Artificial Intelligence,Prof. Amitabha Mukerjee **(code , poster , report)**

Perl Compiler Jan '16 - April '16
Compiler Design, Prof. Subhajit Roy **(code)**

ACADEMIC ACCOLADES

- Received **Academic Excellence Award** twice for outstanding academic performance (awarded to top 7% students in the institute) from 2013-15
- Received an **A* grade** in 8 courses (awarded to top 1-2% students in a course)
- Secured **All India Rank 414** (among 150,000 students) in JEE Advanced 2013
- Secured **All India Rank 313** (among 5,000,000 students) in JEE Mains 2013

TECHNICAL SKILLS

Languages : Python, C, C++, R, BASH, Perl
Software & Tools : TensorFlow, Theano, Caffe, Matlab/GNU Octave, LaTeX, Git

OFFICIAL POSITIONS

Group Leader, Rubik's Cube Hobby Group, IIT Kanpur *2015-16*

- Held workshops for various puzzles such as the Rubik's Cube, 4x4x4 cube, 5x5x5 cube, 2x2x2, Pyraminx and Megaminx
- Coordinated all Blindfolded Rubik's Cube Solving projects done by first year students in the summer of 2015

Event Coordinator, IORC (Indian Open Rubik's Cube) *March '15*

- Appointed judges for all events as well as invigilated over all of them
- Acted as a judge for timing individual solves and provided official scrambles for puzzles

Student Guide at Counselling Service, IIT Kanpur *2014-15*

- Helped 7 freshmen adjust to campus life on their arrival to campus, provided emotional support and academic guidance to them during their first year