Aadil Hayat

2nd year Master Student
Department of Computer Science & Engineering

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Academic Qualifications

Year	Degree/Certificate	Institute	CPI/%
2017 - Present	M.Tech	Indian Institute of Technology, Kanpur	7.3/10
2017	B.Tech	Indian Institute of Technology, Kanpur	8.4/10
2013	CBSE(XII)	Delhi Public School Kalyanpur, Kanpur	94%
2011	ICSE(X)	Margaret Leask Memorial School, Jhansi	90.8%

Scholastic Achievements

- Secured **All India Rank 1729** among nearly **150,000 students** in **JEE Advanced 2013**
- Secured **3rd** position in **Open Soft** (Software Development) competition at **Inter IIT Tech Meet 2015**
- Awarded **2nd Project Appreciation Award** in **TA-202 ME Lab 2014 - 15**
- Secured **3rd** position in **Hackathon** during **Entrepreneurship Summit 2014**
- Secured **All India Rank 42** in **National Talent Search Examination 2012** conducted by **Unified Council**
- Completed Minors in **Artificial Intelligence** and **Computer Systems**

Masters Thesis

- **InfoRL: Information Maximizing Reinforcement Learning** (*July'18-Ongoing*)
  Mentor: Prof. Vinay P. Namboodiri
  - Developed and implemented **InfoPPO** algorithm which uses information maximization to learn interpretable latent codes
  - Ran the experiments on **OpenAI** Mujoco environments to learn latent codes controlling varied configuration over trajectories
  - Trained policy can control speed, configuration, etc for Mujoco control tasks like Walker, Humanoid, etc.
  - Reduced the problem of over-fitting in multi-agent self-competition learning using this algorithm

- **Multi-Task Learning using Adversarial Imitation Learning** (*Jan'18-June'18*)
  Mentor: Prof. Vinay P. Namboodiri
  - Implemented Generative Adversarial Networks for Imitation Learning on complex RL environments
  - Implemented an algorithm to learn a single policy to perform multiple but correlated tasks in Mujoco environments
  - Implemented successful imitation of 2 different driving (pass and turn) tasks in TORCS environment
  - Paper accepted at **NIPS'18** Workshop on Imitation Learning and its Challenges in Robotics

Internships

- **Deep Learning for Population Genetics** (*May'16-Jul'16*)
  Mentor: Prof. Rumi Chunara, NYU, Research Internship
  - Implemented pre-processing of genetic data from FSTAT format to allele-frequency matrix
  - Implemented dimensionality reduction by Auto-encoders using Tensorflow and Keras on HPC cluster
  - Implemented optimal number of clusters prediction using t-SNE, Silhouette coefficient and k-means clustering
  - Developed end-to-end python software for Population Genetics Structure Inference
  - Algorithm is used for deciphering organization of populations in space and time using genetic data.

- **Web Infrastructure and Web Crawling** (*May'16-Jul'16*)
  Mentor: Prof. Manindra Agarwal, New York Office IITK, Research Internship
  - Installed and configured CoreOS and Dockers on a bare metal server remotely.
  - Developed cloud-config for CoreOS and systemd unit services files for various Dockers
  - Developed custom Dockerfiles for Postfix, MySQL and Hadoop cluster
  - Developed DOM parsers for organizations and individuals' pages from professional networking websites
  - Installed and configured Docker based Hadoop cluster using hadoopy Map-Reduce API for Python.

Projects

- **Attack-GANs** (*Jul'17-Nov'17*)
  Mentor: Prof. Piyush Rai, Probabilistic Machine Learning Course
  - Implemented 2 novel approaches to generate adversarial samples to attack Deep Learning based classifiers
  - Used Generative Adversarial training inspired by GANs to learn a generative model to attack Neural Networks
  - Paper Submitted to **NIPS'18** Workshop on Security in Machine Learning

- **Transfer Learning using RL agent** (*Jan'17-Jun'17*)
  Mentor: Prof. Vinay P. Namboodiri, Visual Recognition Course
  - Implemented and trained Asynchronous Advantage Actor-Critic Method based agent for DOOM environment
  - Used the trained Convolutional layers of the agent to perform Computer Vision tasks like object detection,etc.

- **Helicopter Control using Deep RL** (*Jul'16-Nov'16*)
  Mentor: Prof. Mangal Kothari, Undergraduate Project
  - Implemented continuous control using Actor-Critic based Deep RL algorithm in Keras
  - Trained a helicopter agent to learn different tasks from Reinforcement Learning Challenge 2014 environment

- **Dynamic Video Synopsis** (*Jan'16-Apr'16*)
  Mentor: Prof. Vinay P. Namboodiri, Computer Vision Course
  - Implemented optimal reduction of spatial-temporary redundancies in videos
  - Implemented iterative graph-cuts and loopy belief propagation for MRFs formulation of optimization problem

- **IITK Surveillance Video: Object Detection and Classification** (*Jan'16-Apr'16*)
  Mentor: Prof. Harish Karnick, Machine Learning Course
  - Implemented foreground-background separation of surveillance video using Gaussian blur and threshold dilation
  - Implemented object detection by finding contours in background separated video
  - Implemented object classification by bag-of-visual-words model using SIFT descriptors

- **Neural Network Based Chatbot** (*Aug'15-Nov'15*)
  Mentor: Prof. Amitabha Mukherjee, Natural Language Processing Course
  - Implemented Googles Seq2Seq model for modelling conversation
  - Implemented using Googles Tensorflow library for deep learning on Nvidia GTX 760 GPU

- **Mozart Oz Kernel Interpreter** (*Aug'15-Nov'15*)
  Mentor: Prof. Satyadev Nandakumar, Principles of Programming Languages Course
  - Developed Interpreter for Kernel language of Oz
  - Implemented parsing of AST form of code and closure of functions

- **3d Game Its Placement Time** (*Aug'14-Nov'14*)
  Mentor: Prof. Vinay P. Namboodiri, Computer Graphics Course
  - Implemented OpenGL API in C++ to develop a 3d game, a comical picturisation of placements
  - Implemented gravity simulation, multi-player gaming , heads-up display, texture mapping and saving screenshots

Publications & Blogs

- A. Hayat, S. Mittal and V. Namboodiri, "Multi-Task Learning using Conditional Generative Adversarial Imitation Learning," *NIPS Workshop on Imitation Learning and its Challenges in Robotics 2018*
- S. Mittal, A. Hayat and P. Rai, "Deep Generative Models for Generating Adversarial Examples," *Submitted to NIPS Workshop on Security in Machine Learning 2018*
- A. Hayat and D. Erb, "Building a simple Generative Adversarial Network (GAN) using TensorFlow", *Paperspace Blogs*, https://blog.paperspace.com/implementing-gans-in-tensorflow/

Technical Skills

- **Programming Languages:** C, C++, Java, PHP, Python, JavaScript, SQL, Matlab
- **Software and Libraries:** TensorFlow, Keras, Dockers, OpenGL, Scikit-Learn, Hadoop, GIT

Positions of Responsibility

- **Teaching Assistant, Data Structures and Algorithms** (*July'18-Present*)
- **Teaching Assistant, Database Management Systems** (*Jan'18-April'18*)
- **Teaching Assistant, Fundamentals of Computing** (*July'17-Nov'17*)

Relevant Courses

Machine Learning	Computer Vision
Natural Language Processing	Computer Graphics
Probabilistic Machine Learning	Quantum Computing
Data Mining	Game Theory
Database Management Systems	Computer Systems Security
Data Structures	Algorithms