Yogesh Tripathi

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Education

Present **4th Year, B.Tech(Honours) in Computer Science and Engineering**,
Indian Institute of Technology Madras, Chennai, CGPA : **9.25/10.00**

Research Work

Ongoing **Guiding Exploration and Planning in Model Based Reinforcement Learning**
Mentor - Prof. Balaraman Ravindran

- Designed an algorithm with a *Plan When You Can, Learn When You Can't* strategy
- Modeled GridWorld environments as Occupancy Grid and studied different map-building strategies
- Analysed the performance of our algorithm with different deterministic and stochastic GridWorld settings

Ongoing **Online Human Action Recognition with Spatio-Temporal Graph Convolution Network**
Mentor - Prof. Mitesh Khapra

- Implemented Joint Classification-Regression with RNN and Spatio-Temporal GCN for Online Action Recognition task in Tensorflow
- Created an ST-GCN based online action prediction model with augmented regression loss on start and end prediction
- Established better performance of this model than JCR-RNN and ST-GCN on UTKinect-Action3D and PKU-MMD dataset

Jan-May 2019 **Model Based Reinforcement Learning with Graph Interaction Networks**
Mentor - Prof. Balaraman Ravindran

`https://github.com/yogesh1q2w/Model_based_RL_with_GIN-.git`

- Implemented Deep Deterministic Policy Gradient, Trust Region Policy Optimization and Proximal Policy Optimization learning algorithms for Graph-based Model setting
- Analyzed the performance of these algorithms on Swimmer environment of MuJoCo
- Established that Graph Interaction Network based model outperforms Vanilla models

Jan-May 2019 **Parameterized Algorithms for Red-Blue Weighted Vertex Cover on Trees**
Mentor - Prof. N.S. Narayanaswamy

`https://github.com/yogesh1q2w/Red-Blue-Weighted-Vertex-Cover/blob/master/Red-Blue%20Weighted%20Vertex%20Cover.pdf`

- Studied the hardness of Red-Blue Weighted Vertex Cover and relevant relaxations of the problem
- Designed parameterized algorithms through Linear Programming techniques and Bounded Search Trees
- Analyzed the time complexity of algorithms and possible reductions through kernelizations

Projects

May-Jul 2018 **Dynamic Graph Algorithms**
Mentor - Prof. Rupesh Nasre

`https://github.com/yogesh1q2w/Dynamic-Graph-Algorithms`

- Built a C++ library for fully dynamic graphs allowing real time edge insertions and deletions
- Implemented efficient algorithms to support connectivity, minimum spanning tree and shortest path

Jan-May 2019 **Image Captioning System using end-to-end Encoder-Decoder paradigm**
Mentor - Prof. Sutanu Chakraborti

`https://github.com/yogesh1q2w/Image-Captioning`

- Built an end-to-end Image Captioning System using the Encoder-Decoder paradigm of Deep Learning
- Incorporated Attention Mechanism to improve the quality of captions

May-Jul 2018 **Classification of customers based on savings and spending data**
Mentors - Prof. Nandan Sudarsanam, Prof. Balaraman Ravindran

- Analyzed savings and spending patterns of customers from the data provided by bank
- Used PU Learning for deducing useful insights and classifying the customers based on spending patterns

Industrial Experience

May-Jul 2019 **Summer Intern at Gartner India Research and Advisory Services Pvt. Ltd. - Advanced Analytics**

- Analyzed the efficacy of performance metrics used to evaluate client partners in previous year
- Automated daily reporting procedure of specific metrics for four Business Units by building tools
- Built a dashboard in Microsoft PowerBI for reporting performance metrics for one Business Unit

Scholastic Achievements

- Among the top 0.001 percentile(All India Rank-1626) in JEE Main, 2016 amongst about 11 lakh candidates
- Among the top 0.02 percentile(All India Rank-4755) in JEE Advanced, 2016 amongst about 2 lakh candidates
- Eligible for Scholarship for Higher Education under Innovation in Science Pursuit for Inspired Research(INSPIRE) for being in top 1% in ISC 2016 examination

Courses

- **Artificial Intelligence**
  - Deep Learning
  - Pattern Recognition and Machine Learning
  - Non linear optimization*
  - Reinforcement Learning
  - Natural Language Processing
- **Systems and Algorithm Design**
  - Design and Analysis of Algorithms
  - Programming and Data Structures
  - Operating Systems
  - Object-Oriented Algorithms Lab
  - Topics in Design and Analysis of Algorithms
  - Introduction to Computer Networks
  - Compiler Design
  - Computer Organization and Architecture

* - Ongoing course

Skills

Languages C, C++, Python, Java, R, MATLAB, Prolog, Lisp, Octave, x86 Assembly

Tools TensorFlow, PyTorch, Keras

Positions of Responsibility

2017-current **Class Representative - 2016 Batch**

- Member of the class committee and class representative of 2016 batch students
- Assisted students with issues in courses by communicating it to the class committee

2018 **Nirmaan - Finance Officer**

- Nirmaan is a pre-incubation cell for start-ups in IIT-M
- Maintained records of financial transactions for around 22 start-ups
- Coordinated communication among the start-ups and higher authorities

2018 **Exebit - Publicity coordinator**

- Exebit is an annual Computer Science Department Fest in IIT-M
- Promoted the events in Exebit by creating social media postings
- Conducted events in Anna University, Chennai for offline publicity

Extra Curricular Activities

2016-17 **National Service Scheme - Volunteer**

- Completed a teaching project in Lady Nye Nursery and Primary School, Chennai for three months
- Participated in weekly collection drives conducted in residential area of IIT-M

2017-19 **Marathons**

- Completed 5 km Aarogyathon conducted by Disaster Management Committee in 2019
- Completed 4 km 'Sports for Mental Health Run' conducted by Shaastra and Decathlon in 2018
- Completed 4 km marathon conducted by Samanvaay in 2018

2017 **Fresher's Volunteer**

- Assisted the newly joining batch of 2017 with general query and help