

# Deepanshu Malhotra

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## EDUCATION

University School of Information, Communication and Technology

Guru Gobind Singh Indraprastha University

*B.Tech, Computer Science and Engineering*

Honor: Gold Medal (*B.Tech CSE Rank 1*)

New Delhi, India

August 2015 - May 2019

GPA: 8.5/10

## PROGRAMMING SKILLS

Languages: C, C++, Python, Java, MATLAB, HTML, MY SQL, NetLogo,  $\LaTeX$ .

Areas: Social Network Analysis, Artificial Intelligence, Machine Learning, Reinforcement Learning, Computer Vision, Algorithms, Databases, Mathematics.

## PUBLICATIONS

- **Deepanshu Malhotra**, Raluca Gera, and Akрати Saxena. *Community Detection using Semilocal Topological Features and Label Propagation Algorithm*, International Conference on Computational Data and Social Networks (CSoNet), 2021. DOI: [https://doi.org/10.1007/978-3-030-91434-9\\_23](https://doi.org/10.1007/978-3-030-91434-9_23).
- **Deepanshu Malhotra** and Anuradha Chug. *A modified label propagation algorithm for community detection in attributed networks*, IJIM Data Insights, Elsevier. DOI: <https://doi.org/10.1016/j.ijime.2021.100030>.
- **Deepanshu Malhotra** and Rinkaj Goyal. *Supervised-Learning Link Prediction in Single layer and Multiplex networks*, Machine Learning with Applications, Elsevier. DOI: <https://doi.org/10.1016/j.mlwa.2021.100086>.
- **Deepanshu Malhotra** and Rinkaj Goyal. *Link prediction in complex networks using information-theoretic measures*, Journal of Complex Networks, Oxford University Press (**SCI (E) indexed**). DOI: <https://doi.org/10.1093/comnet/cnaa035>.
- **Deepanshu Malhotra**. *Community Detection in Complex Networks using Link Strength based Hybrid Genetic Algorithm*, SN Computer Science, Springer. DOI: <https://doi.org/10.1007/s42979-020-00389-4>.
- **Deepanshu Malhotra** and Rahul Katarya. *A Survey of Different Methods in Finding Latent Relationships among Complex Networks*, International Conference on Information Systems and Computer Networks (ISCON), 2019, IEEE.

## EXPERIENCE

**Guide: Prof. Raluca Gera (Naval Postgraduate School, Monterey, CA 93943, USA)**

Remote

*Research Collaborator*

June 2021 - November 2021

- Proposed a novel solution for detecting communities by utilizing semilocal structural features for a label propagation based algorithm.
- Our algorithm showed improved performances on a variety of data sets for detecting disjoint communities.

### **USICT, GGSIPU**

New Delhi

*Research Assistant, Guide: Prof. Anuradha Chug*

March 2021 - July 2021

- Developed a novel community detection approach in complex networks. Utilized the node attributes to generate relevant communities from the nodes in the network.
- The proposed approach is able to execute in linear time and is scalable to large network data sets.

### **USICT, GGSIPU**

New Delhi

*Research Assistant, Guide: Prof. Rinkaj Goyal*

November 2018 - April 2021

- Developed three new algorithms that combined unsupervised learning methods with the information theoretic techniques for predicting the connections. Our research got published in the Journal of Complex Networks, Oxford University Press.
- Simultaneously worked on supervised learning approaches for predicting links in single layer and multiplex networks.

### **Institute of Systems Studies and Analysis, DRDO**

New Delhi

*Guide: Dr V.G. Patil*

May 2018 - August 2018

- Studied various reinforcement learning methodologies and identified Q-learning technique for its efficiency. Subsequently applied Q-learning to balance a pole on a cart. The program was able to balance the pole for more than 200 time steps.

### **BSES Rajdhani Power Limited (BRPL)**

New Delhi

*Intern*

December 2017 - January 2018

- Studied about SCADA (Supervisory control and data acquisition) which is a system of software that monitors, gathers, and processes real-time data from devices such as sensors, valves, power grids, etc.

## PROJECT WORK

### **Link Prediction and Assessment in Complex Networks**

*Guide: Prof. Rinkaj Goyal, USICT, GGSIPU*

Spring 2019

- Implemented a homophily based machine learning model for predicting the links in complex networks. The model attained 98% accuracy for finding the true links. Coded different structural similarity methods for assessing the connection strength.

## **Reinforcement Learning in Multiagent Systems ([Link](#))**

New Delhi

*Guide: Prof. Anuradha Chug, USICT, GGSIPU*

*Fall 2018*

- Developed a multi-agent environment, i.e., a game of pong, and trained the two agents individually, with the Deep Q-learning model. Successfully reduced the training time by tuning the parameters of the deep learning model.

## **Object Detection and Tracking ([Link](#))**

*Self-Driving Car Engineer Nanodegree Udacity*

*Spring 2018*

- Performed a Histogram of Oriented Gradients feature extraction, color transformation on a labeled training set of images. Trained an SVM image classifier, and implemented a sliding-window technique to search for vehicles in a video stream.

## **Achievements and Extracurricular activities**

- **Reviewer** for International Journal of Information Technology & Decision Making, World Scientific (SCI (E) indexed).
- Awarded **Gold Medal** for standing **First** in the order of merit in B.Tech. Computer Science and Engineering.
- Successfully graduated the Self-Driving Car Engineer Nanodegree program.
- Qualified for ACM ICPC Multisite Regionals 2018 at the Kanpur site.
- Qualified for ACM ICPC Multisite Regionals 2016 at the Coimbatore site.
- Qualified IPU CET in the top 2% of the candidates to secure a seat in the most prestigious college under Guru Gobind Singh Indraprastha University.

## **Relevant Online Courses**

Self-Driving Car Engineer Nanodegree Udacity; Neural Networks and Deep Learning (coursera); Improving Deep Neural Networks: Hyperparameter tuning; Regularization and Optimization (coursera); Structuring Machine Learning Projects (coursera); Machine Learning (coursera); Reinforcement Learning (on udacity by georgia tech).