

# Manasi Malik

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## EDUCATION

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### Johns Hopkins University (JHU)

JAN'21 – PRESENT

Ph.D. in Cognitive Science

COMPUTATIONAL COGNITIVE SCIENCE TRACK

PI: Dr. Leyla Isik

### Indraprastha Institute of Information Technology, Delhi (IIIT Delhi)

APR'15 – MAY'19

Bachelor of Technology (Honors)

Major: ELECTRONICS & COMMUNICATION ENGINEERING

Minor: COMPUTATIONAL BIOLOGY

## INDUSTRY EXPERIENCE

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### Researcher at TCS Research and Innovation

AUG'19 – DEC'20

I worked on developing deep-learning methods to improve effectiveness of advertising using user behaviour data.

## PUBLICATIONS & SELECTED PRESENTATIONS

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*Publications* **Manasi Malik**, and Leyla Isik. [Relational Visual Information Explains Human Social Inference: A Graph Neural Network Model for Social Interaction Recognition](#). PsyArXiv, 3 Nov. 2022. (submitted for peer review)

**Manasi Malik**, Leyla Isik [Social Inference from Relational Visual Information](#). Journal of Vision 2022 (abstract only)

**M. Malik**, G. Gupta, L. Vig, and G. Shroff, [BCQ4DCA: Budget Constrained Deep Q-Network for Dynamic Campaign Allocation in Computational Advertising](#), IEEE International Joint Conference on Neural Networks, 2021 (IJCNN '21).

Yashaswi Rauthan, Vatsala Singh, Rishabh Agrawal, Satej Kadlay, Niranjan Pedanekar, Shirish Karande, **Manasi Malik**, and Iaphi Tariang, [Avoid Crowding in the Battlefield: Semantic Placement of Social Messages in Entertainment Programs](#), International Workshop on AI for Smart TV Content Production, Access and Delivery (AI4TV '20)

**Manasi Malik**, Ganesh Bagler, and Arpan Banerjee. [Network analysis of neuro-cognitive processes: studying mcgurk effect using EEG data](#), IIITD, 2019.

*Talks* **Manasi Malik**, Leyla Isik [Social Inference from Relational Visual Information](#), Vision Sciences Society (VSS '22), Florida, USA

*Posters* **Manasi Malik**, Leyla Isik, [Social Inference from Relational Visual Information: An Investigation with Graph Neural Network Models](#), Conference on Cognitive Computational Neuroscience (CCN'22), San Francisco, USA (poster)

## PROJECTS

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### COMPLEX NETWORKS ANALYSIS AND COMPUTATIONAL MODELING

#### Social Inference from Relational Visual Information

JAN'21 – PRESENT

Advisor: [Dr. Leyla Isik](#)

I am working on modeling third-person social interaction judgments by humans from visual stimuli. We hypothesize that relational representations of visual stimuli lead to more human-like social judgements.

<b>Network Analysis of Neuro-Cognitive Processes: Studying McGurk Effect using EEG Data</b>	MAY'18 – MAY'19
<i>Advisors: Dr. Arpan Banerjee, Dr. Ganesh Bagler, Dr. Dipanjan Roy</i>	
Investigated multi-sensory perception involving auditory and visual cues using McGurk effect. My focus in this research was to understand the network properties of the brain using EEG data obtained from multiple subjects. <a href="#">[LINK]</a>	
<b>Network Analysis of Food-Disease Associations</b>	JAN'18 – NOV'18
<i>Advisor: Dr. Ganesh Bagler</i>	
The focus of this research was to use clustering analysis to infer how different food and disease categories relate to each other. We created signed bipartite graphs using mined food-disease associations data and found clusters using Bi-Louvain algorithm. <a href="#">[LINK]</a>	
<b>Controllability Analysis in Brain Networks</b>	AUG'17 – NOV'17
<i>Advisor: Dr. Ganesh Bagler</i>	
Aimed to find different driver regions in a Mouse Brain network which when controlled, can affect the behavior of the animal. Used Network Theory.	
<b>Dynamic Analysis For Neuropathic Excitability</b>	JAN'18 – APR'18
<i>Advisor: Dr. Sriram K</i>	
Implemented the paper "Identification of Molecular Pathologies Sufficient to Cause Neuropathic Excitability In Primary Somatosensory Afferents Using Dynamical Systems" by Rho, Prescott 2012, using MATLAB.	

## IMAGE AND SIGNAL PROCESSING

<b>Face and Kinship Verification in the Wild</b>	JAN'19 – APR'19
<i>Advisor: Dr. A V Subramanyam</i>	
The goal of the project was to use Large-margin multi-metric learning (LM3L) method to decide whether there is a kinship relation between two individuals via their face images.	
<b>PhotoFix : Fixing Photos Using Semantically Similar Images</b>	AUG'17 – NOV'17
<i>Advisor: Dr. A V Subramanyam</i>	
The goal of this project was to fix patches and holes in pictures - or imperfectly taken photos - by replacing these with information from other semantically similar pictures.	
<b>Emotion Detection through EEG signals</b>	AUG'16 – NOV'16
<i>Advisor: Dr. Anubha Gupta</i>	
Used electroencephalogram (EEG) data for emotion recognition in human beings. Trained a Support Vector Machine (SVM) classifier where features were frequency data from Fourier Transform and Wavelet Transform of the signals	

## MACHINE LEARNING

<b>RL for Grocery Shopping Solutions</b>	JAN'18 – APR'18
<i>Advisor: Dr. Sanjit Kaul</i>	
Used reinforcement learning techniques to make grocery shopping easier. Modeled variables like price, availability, travelling cost for multiple shops.	
<b>RLdrive: Reinforcement Learning for Better Driving Decisions</b>	AUG'17 – NOV'17
<i>Advisor: Dr. Saket Anand</i>	
Used RL techniques to make agent reach from start to goal position while minimizing costs. The environment created had randomly placed obstacles. We aimed to explore if spatial and temporal information from different vehicles can help make better decisions.	

## TEACHING

Teaching Assistant, Introduction to Cognitive Neuropsychology (JHU)	Spring 2023
Teaching Assistant, Visual Cognition (JHU)	Spring 2022
Teaching Assistant, Computational Social Cognition (JHU)	Fall 2022
Teaching Assistant, Indian Poetry Through The Ages (IIITD)	Winter 2019
Teaching Assistant, Introduction to Poetry (IIITD)	Monsoon 2016

## SKILLS

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PROGRAMMING SKILLS	- Proficiency in MATLAB, Python - Exposure to C/C++, SQL, HTML, Verilog HDL, AVR Programming
TOOLS AND TECHNOLOGIES	- Competitive programming course (CodeChef challenges, Summer 2016) - Tensorflow, PyTorch, Brain Connectivity Toolbox, EEGLAB toolbox, BioPython toolbox - NetworkX, Scikit-learn, Pajek, Cytoscape, OpenCV
ONLINE COURSES	- NENGO, LTSpice, Xilinx ISE, Linux, Git, Docker, Sublime Text - Computational Neuroscience, University of Washington ( <a href="#">Coursera</a> ) - The Brain and Space, Duke University ( <a href="#">Coursera</a> )
WORKSHOPS	- An Introduction to Interactive Programming in Python, Rice University ( <a href="#">Coursera</a> ) - Summer School on Statistical and Machine Learning Approaches in Neuroimaging and Cognitive Neuroscience, IIIT Hyderabad ( <a href="#">SSNI2017</a> )

## AWARDS AND ACHIEVEMENTS

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- **All Rounder Award, ECE department** 2019 graduating batch
- **Qualified for DST INSPIRE Scholarship** - 2015 (Through Admission to Indian Institute of Science Education and Research Mohali)
- Top ranks in multiple district/zonal school level soccer tournaments (8th -11th standards).
- Inter College Tournament Medals in: **Football** (IIT Roorkee '19 : **Gold**, IIT Kanpur '18: **Silver**); **Basketball** (IIITM Gwalior '16: **Silver**)

## ORGANIZATIONAL SKILLS

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- Active member of the **Diversity and Representation Committee**, Dept. of Cognitive Science, JHU
- Curator for **TEDxIIITD '18**
- **Student Council** Representative for ECE batch in 2017-18
- **Sports Council** Representative for Women Sports in 2016-17
- **Co-founded** the IIITD Girls' Football Team
- **Co-ordinator**, Bio-Bytes Club (Jan'17 - May'17)
- Photography Cell Member, **Media Panel**: 2017-19
- **Vice Captain**, Girls' Basketball team: 2016-17
- Volunteer for **One Nation Netball Cup**