Aditya Gulati

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ELLIS Unit Alicante

AREA OF INTEREST

Human Behaviour Modelling, Artificial Intelligence, Cognitive Biases

EDUCATION

PhD in Computer Science 2022-Present
University of Alicante

Integrated MTech in Computer Science 2016-2021
International Institute of Information Technology, Bangalore

CURRENT RESEARCH

Humans have been known to exhibit irrational behaviour in many situations. Our current AI systems however, are not well equipped to deal with or understand these types of behaviour. Our goal is to build an understanding of these irrational behaviours into our AI systems in order to design tools that can help us make better decisions.

PAST POSITIONS

Visiting Scholar 2020-2021
DDMLab, Carnegie Mellon University

- Worked in collaboration with Prof. Cleotilde Gonzalez on my masters thesis.

Teaching Assistant 2020
IIIT Bangalore

- Teaching assistant for courses on Linear Algebra (Spring 2020) and Automata Theory and Computability (Fall 2020).

Reviewer 2020-2022
Sadhana

- Reviewed papers for Sadhana, a Springer journal in India.

DAAD Scholar 2019
Vision and Perception Science Lab, Ulm University

- Worked as a research intern under Prof. Dr. Heiko Neumann. on a brain inspired motion estimation system. My stay was funded by a scholarship from the DAAD.

Student Affiliate 2018-2021
Multimodal Perception Lab, IIIT Bangalore

- Worked on multiple research projects under the supervision of Prof. Dinesh Babu.

SKILLS

Languages - Python, C++, C, Julia, Java
Libraries and Frameworks - OpenCV, PyTorch, Pandas, Numpy, Gym
Hardware - Arduino, Raspberry Pi
Tools - Git, LaTeX

SELECTED PROJECTS

Human-Machine Teaming [AAAI Fall Symposium, 2021] 2020-2021

Lab: *DDMLab, Carnegie Mellon University ;* ***Supervisor:*** *Prof. Cleotilde Gonzalez*

We worked on understanding how humans make decisions in groups and how group size is related to the complexity of the task. For this study, we used Instance Based Learning Agents to simulate human performance on a large search and rescue task.

Sociological Theories of The Mind 2020

Supervisor: *Prof. Bidisha Chaudhuri*

In recent years, studying the mind has become interesting for computer scientists. However, before this spike, there were multiple studies performed to better understand various aspects of the mind by sociologists, many of which con- tinue to this day. Here, we look at some of these theories and the gap that exists between them and where AI stands today.

Interleaving Fast and Slow Decision Making [ICRA, 2021] 2019-2020

Supervisor: *Prof. Shrisha Rao*

Daniel Kahneman in his book 'Thinking, Fast and Slow' proposed that we have two systems of thinking that we use to make decisions - a slow logical system and a fast intuition based system. However, while performing a certain task we don't always use these systems independent of each other to make decisions. In this work, we explored methods of incorporating these different styles of thinking to make better decisions overall. Our ideas were tested on Pac-Man, a classic arcade game.

Motion Detection Using Brain Inspired Models 2019

Lab: *Vision and Perception Science Lab ;* ***Supervisor:*** *Prof. Dr. Heiko Neumann*

We were designing a system to detect motion in a sequence of images using our understanding of the V1 and MT regions of the visual cortex. We modelled the V1 cells as spatio-temporal filters and estimated the motion energy. Our MT cells pool these responses and were used to estimate velocity at every point in the image. This was designed to be used on input from an event-based camera.

Unsupervised Domain Adaptation 2019

Lab: *Multimodal Processing Lab ;* ***Supervisor:*** *Prof. Dinesh Babu*

Training a neural network requires a lot of data. A method to avoid this would be of great help to the community. We built a system which learns persuasiveness of a video in a labelled domain and transfers that to a related but unlabelled domain. Currently, we are writing a paper detailing our approach and results.

RELEVANT COURSES

Math - Linear Algebra, Sequences and Series, Probability and Statistics, Bayesian Statistics, Differential Equations, Discrete Maths (Set Theory, Graph Theory)
Data Science - Machine Learning, Probabilistic Graphical Models, Artificial Intelligence, Reinforcement Learning, Natural Language Processing, Artificial General Intelligence
Computer Science - Data Structures & Algorithms, Database systems, Operating Systems, Programming Language Theory, Computational Geometry
Social Science - Economics, A History of Ideas, Digital Sociology, Techno Economics of Networks