Aditya Gulati

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ELLIS Alicante

AREAS OF INTEREST

Human Behavior Modeling, Artificial Intelligence, Cognitive Biases, Beauty Filters

EDUCATION

PhD in Computer Science 2022-Present

ELLIS Unit Alicante; University of Alicante

- ELLIS PhD student supervised by Dr. Nuria Oliver, Dr. Bruno Lepri and Dr. Miguel Angel Lozano

Integrated MTech in Computer Science 2016-2021

International Institute of Information Technology, Bangalore

- CGPA: 3.88/4
- Placed on the deans merit list every year

CURRENT RESEARCH

Humans have been known to exhibit irrational behavior in many situations. Our current AI systems however, are not well equipped to deal with or understand these types of behaviors. My work is focused on bridging this gap in order to foster healthier relations between us and the tech we use. Recently, I have been focused on the attractiveness halo effect and how beauty filters mediate the effect on decisions made by humans and AI systems.

PAST POSITIONS

Visiting Researcher 2023,2024

Fondazione Bruno Kessler

Visiting researcher at the Mobile and Social Computing Lab at Fondazione Bruno Kessler

Co-Organizer 2022

ELLIS Doctoral Symposium

Co-organised the annual ELLIS Doctoral symposium for 200 attendees coordinating a team of 10 volunteers.

Visiting Scholar 2020-2021

DDMLab, Carnegie Mellon University

Worked in collaboration with Prof. Cleotilde Gonzalez on human-AI teaming as a part of my masters thesis.

DAAD Scholar 2019

Vision and Perception Science Lab, Ulm University

Worked as a research intern, funded by a DAAD scholarship, under Prof. Dr. Heiko Neumann. on a brain inspired motion estimation system.

Teaching Assistant 2020

IIIT Bangalore

Teaching assistant for courses on Linear Algebra and Automata Theory and Computability.

Student Affiliate 2018-2021

Multimodal Perception Lab, IIIT Bangalore

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

TECH STACK

Languages - Python, R, C++, C, JavaScript, Julia, Java
Libraries and Frameworks - OpenCV, PyTorch, Pandas, NumPy, Gym, Flask
Hardware - Arduino, Raspberry Pi
Tools - Git, LaTeX HTML, CSS, SQL, AWS

PUBLICATIONS

Lookism: The overlooked bias in computer vision 2024
***A Gulati**, B Lepri, N Oliver*
Accepted at the Fairness and ethics towards transparent AI: facing the chalLEnge through model Debiasing (FAILED) workshop at ECCV

What is beautiful is still good: The Attractiveness Halo Effect in the era of AI-based Beauty Filters 2024
***A Gulati**, M Martinez-Garcia, D Fernandez, MA Lozano, B Lepri, N Oliver*
Presented at the 10th International Conference on Computational Social Science (IC2S2)

BIASeD: Bringing Irrationality into Automated System Design 2022
***A Gulati**, B Lepri, MA Lozano, N Oliver*
Presented at the AAAI Fall Symposium workshop on *Thinking Fast and Slow and Other Cognitive Theories in AI*

Task complexity and performance in individuals & groups without communication 2021
***A Gulati**, TN Nguyen, C Gonzalez*
Presented at the AAAI Fall Symposium workshop on *Theory of Mind for Teams*

Interleaving Fast and Slow Decision Making 2021
***A Gulati**, S Soni, S Rao*
Presented at the IEEE International Conference on Robotics and Automation, 2021

TALKS AND PRESENTATIONS

Poster at the ECCV 2024 workshops 2024
Milan, Italy

Poster at the International Conference on Computational Social Science 2024
Philadelphia, USA

Invited panellist in the "AI PhD and Postdoc education: ELLIS Experience" panel at the 4th Community Workshop 2024 & AIDA Symposium 2024
Thessaloniki, Greece

Oral presentation at the International Conference on Thinking 2024
Milan, Italy

Invited talk at the Behavioral Insights Bicocca Journal Club 2024
(Remote)

Poster presentation at the Summer Institute on Bounded Rationality organised by the Max Planck Institute for Human Development 2023
Berlin, Germany

Invited talk on "Biases and AI" at the Max Planck Institute for Software Systems (MPI-SWS) 2022
(Remote)

Oral presentation at the AAAI 2022 Fall Symposium on Thinking Fast and Slow and Other Cognitive Theories in AI 2022
Arlington, United States of America

Talk on AI and Human Biases at the University of Alicante 2022
Alicante, Spain

SERVICE TO THE COMMUNITY

- External reviewer for IC^{2}S^2 '24 2024
- Co-organiser of the Collaborative AI And Modeling Of Humans (CAIHu) bridge program at AAAI 2024
- Co-organizer of the ELLIS-DDMLab Workshop in Alicante 2023
- Mentor at the Innovation Banking Hack Fest organised by Banco Sabadell 2023
- Program Committee Member for HCAI@NeurIPS'22 2022
- Program Committee Member for ECML-PKDD 2022
- Student volunteer for HCAI@NeurIPS'21 2021
- Co-organiser of the ELLIS HCML Reading Group 2021-Present
- External Reviewer for Springer's Sadhana Journal 2020-2023

SELECTED PROJECTS

The Beauty Survey: A Study on the Attractiveness Halo Effect 2023
Lab: *ELLIS Alicante* ; ***Supervisor:*** *Prof. Nuria Oliver*

We ran the largest study to date (n=2748) investigating the impact of beauty filters on the attractiveness halo effect in judgments made by human raters. We find evidence of the halo effect with beauty filters and report an ability of these filters to mitigate the effect in certain conditions. Our findings also bridge some conflicting findings in the literature regarding the halo effect. The results of this study have been presented at relevant workshops and have been accepted for publication at the Royal Society Open Science.

Bringing Irrationality into Automated System Design 2022

Lab: *ELLIS Alicante* ; ***Supervisor:*** *Prof. Nuria Oliver*

While cognitive biases are a core part of our decision making, the interaction between AI systems and our biases is not well studied. In this work, we propose a taxonomy of biases that can support the design of systems that are aware of our biases. We also identify three broad research areas and seven research questions.

Human-Machine Teaming 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 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 UNIVERSITY 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