Raghav Arora

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EDUCATION

B.E. - Electrical and Electronics Engineering + MSc. Chemistry   Pilani, India | 2017-2022
BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI   CGPA: 8.86/10

RESEARCH EXPERIENCE

INTERNATIONAL INSTITUTE OF INFORMATION TECHNOLOGY - HYDERABAD | RESEARCH ENGINEER
Hyderabad, India | October 2022 – Present

- As a part of the Robotics Research Center under Prof. K. Madhava Krishna, I lead multiple projects on vision and language guided robotic applications.
- Combined graph networks with multimodal input data to develop Commonsense Reasoning and map objects to their correct rooms for rearrangement challenge in Embodied AI.
- Incorporating world knowledge displayed by LLMs to allow a household agent to anticipate future tasks.
- Using classical PDDL based planners to generate plans of robotic actions for long-horizon anticipated tasks.
- Showed downstream applications of projects in different simulation environments like AIHabitat, AI2THOR and VirtualHome

UNIVERSITY OF LUXEMBOURG | RESEARCH ASSISTANT (RA)
GUIDE: PROF. ALEXANDRE TKATCHENKO   Luxembourg | Jun 2021 - Oct 2022

- Developed deep learning models for quantum chemistry using the Density Functional Tight-Binding Method.
- Applied innovative methods to develop novel molecular descriptors to encode molecules for neural network input.
- Geometric descriptors from semi-empirical quantum-chemistry methods were combined with molecular descriptors to predict physicochemical properties of drug molecules.

PUBLICATIONS

[1] **Raghav Arora**, Ayush Agrawal, Ahana Datta, Snehasis Banerjee, Brojeshwar Bhowmick, Krishna Murthy Jatavallabhula, Mohan Sridharan, and Madhava Krishna. 2023. "CLIPGraphs: Multimodal Graph Networks to Infer Object-Room Affinities". In: 2023 32nd IEEE International Conference on Robot and Human Interactive Communication (RO-MAN). IEEE. doi: `10.48550/arXiv.2306.01540`.

FELLOWSHIPS

EASTERN EUROPEAN MACHINE LEARNING SUMMER SCHOOL, 2023 ↗   KOŠICE, SLOVAKIA JULY, 2023
I presented our work on CLIPgraphs, at the 5th edition of the EEML summer school. I received full research and travel grant from the organizers: Google DeepMind, ESET, and AIslovakIA.

GLOBAL RESEARCH FELLOWSHIP, 2022 ↗   IPCD BITS PIlani
I received the global research fellowship from IPCD, BITS Pilani for my thesis work on 'Deep learning for quantum chemistry using Density Functional Tight-Binding Method'

PROJECTS

INVESTIGATION OF IMAGE MOSAICING TECHNIQUES FOR UAV NAVIGATION |
NETRA RESEARCH GROUP   BITS PIlani |
Multiple aerial images captured by Unmanned Aerial Vehicles (UAVs) are stitched together in real time using image registration and blending algorithms. The new image hence generated is used for navigation of swarm of small robots.

SKILLS

Areas of interest: Embodied AI, Robotics, Perception, Planning, Computer Vision   **Languages:** Python, C++, C, Java, Bash, Matlab
Technology Pytorch, Keras, OpenCV, Git, Blockchain, , SQL