Ayush **JAIN**

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Education

Carnegie Mellon University — Pittsburgh, PA
Masters in Robotics (4.08 / 4.0) — Aug. 2021 – Present
Thesis Advisor : Prof. Katerina Fragkiadaki
Thesis Committee : Prof. Tom Mitchell & Nikolaos Gkanatsios

Birla Institute of Technology & Sciences — Rajasthan, India
Bachelor in Computer Science (9.33 / 10.0) — Aug. 2017 – May 2021
Thesis : Active Embodied Vision - Towards Self-Supervised Never Ending Learners
Thesis Advisor : Prof. Katerina Fragkiadaki & Prof. Pratik Narang

Publications

2022 Gkanatsios, N.*, **Jain, A.***, Zhou X., Zhang Y., Atkeson, C., Fragkiadaki, K., 2022 "Spatial reasoning as Object Graph Energy Minimization". **(In Submission)** Paper

2022 **Jain, A.***, Gkanatsios, N.*, Mediratta, I., Fragkiadaki, K., 2022 "Bottom Up Top Down Detection Transformers for Language Grounding in Images and Point Clouds". **(ECCV 2022)** Paper Code

2021 Fang, Z.*, **Jain, A.***, Sarch, G.*, Harley, A., Fragkiadaki, K., 2020 "Move to See Better : Self-Improving Embodied Object Detection". **(BMVC 2021)** Paper Code

2021 **Jain, A.***, Ramaprasad, R.*, Narang, P., et al., 2020 "AI-Enabled Object Detection in Unmanned Aerial Vehicles for Edge Computing Applications." **(IEEE Network. 2021)** Paper Code

2020 Dawei Du, Longyin Wen, Pengfei Zhu, Heng Fan, Qinghua Hu, Haibin Ling, Mubarak Shah, **Jain, A.**, Narang, P., et al., 2020 "VisDrone-DET2020 : The Vision Meets Drone Object Detection in Image Challenge Results." **(ECCV 2020 Workshop)** Paper

2020 **Jain, A.**, Meenachi, N.M. and Venkatraman, B., 2020 "NukeBERT : A Pre-trained language model for Low Resource Nuclear Domain." arXiv preprint arXiv:2003.13821 (2020). Paper Code

Research Collaborations with Non-Academic Institutions

Jan 2022 – Present | **Microsoft Turing Academic Program, Redmond, USA**
Website
- CMU-MSTAP project "Learning instructible visuo-motor agents through multimodal interactive teaching"

Dec 2021 – Present | **Amazon Alexa Prize SimBot Challenge, Seattle, USA**
Team Page
- Developing multimodal instruction following agents as a member of CMU Symbiote Team
- Our team got 2nd place in the first phase of the competition.

Academic and Industrial Research Experience

August 2021 – Present | **Carnegie Mellon University | Graduate Research Assistant, Pittsburgh, USA**
- With Prof. Katerina Fragkiadaki, I am working on language grounding in static 2D and 3D scenes, robot manipultation following language instructions, and instruction following in indoor household environment.

May 2022 – August 2022 | **Apple Machine Learning Research | Research Intern, Cupertino, USA**

- With Dr. Navdeep Jaitley and Dr. Miguel Bautista, I worked on few-shot multimodal representation learning.

May 2020 – July 2021 | **Carnegie Mellon University | Research Associate, Pittsburgh, USA**

Project Page Code Paper

- With Prof. Katerina Fragkiadaki, I developed a method enabling an embodied agent to learn about objects without ground truth supervision in an unseen 3D environment by allowing the agent to move around.

August 2019 – May 2020 | **MultiCog Research Group | Computer Vision Research Assistant, Pilani, India**

Project Page Code Paper

- With Prof. Pratik Narang, I built an object detection model for aerial images improving over Retinanet model by 10%

May 2019 – August 2019 | **Indira Gandhi Center for Atomic Research | Research Assistant, Chennai, India**

Project Page Code Paper

- With Dr. N.M. Meenachi, I built the first nuclear language dataset - NText and NQuAD(Nuclear Question Answering Dataset) consisting of 730 question-answer pairs.

Academic and Administrative Experience

2020-22	Reviewer for CVPR 2021-23, ECCV 2022, BMVC 2021-22, TPAMI 2021-22
2019-20	Teaching Assistant, Artificial Intelligence at BITS PILANI
2019-20	Teaching Assistant, Machine Learning at BITS PILANI
2019-20	Team Leader, Microsoft Student Partner, BITS Pilani
2018-20	Teaching Assistant, Computer Programming at BITS PILANI

Awards and Scholarships

2021-2023	**Research Scholarship** Full tuition funding and stipend for my masters in robotics.
2019-20	**Google AI Summer School** 1/50 students across India selected for Google AI summer school
2019-20	**York CVR – VISTA Vision Science Summer School** 1/50 students selected worldwide
2018-20	**Institute Merit Scholarship** Awarded to top 3% students for Exceptional Performance
2017-18	**Mcrosoft Codefundo++ Hackathon** Placed 3rd/150+ teams on campus
2016-17	**KVPY Scholar** A national level drive for adjudging high research potential
2016-17	**National Science Examination in Physics (NSEP) Fellow**

Technical Expertise

Programmation	**Python**, **C**, **C++**, Java, HTML, CSS
Frameworks	**Pytorch**, **Tensorflow**, Django
Simulators	PyBullet, Ai2Thor, Habitat AI, Open AI Gym

References

Prof. Katerina Fragkiadaki, Asst. Prof., Machine Learning Dept., Carnegie Mellon University;katef@cs.cmu.edu
Prof. Christopher G. Atkeson, Prof., Robotics Institute, Carnegie Mellon University; cga@andrew.cmu.edu
Dr. Navdeep Jaitly, Research Scientist, Machine Learning Research, Apple; njaitly@apple.com
Dr. Miguel A. Bautista, Research Scientist, Machine Learning Research, Apple; mbautistamartin@apple.com
Prof. Pratik Narang, Asst. Prof., Computer Science Dept., BITS Pilani; pratik.narang@pilani.bits-pilani.ac.in