Mohit Vaishnav
Artificial Intelligence Researcher

Profile

Broadly my research revolves around exploring different aspects of the abstract reasoning abilities forming the core of intelligence in both humans and animals and incorporating them into machines. I have more than 5 years of experience in developing Deep Neural Networks for Computer Vision and medical imaging for both academia and industries with publications in top tier conferences like NeurIPS, ICLR.

Work experience

Research Engineer
WeDiagnostiX, Paris France

Aug. 2019 ↑ Feb. 2019

- Developed the first working prototype for the classification and understanding of maxillary structures from X-ray imaging using Deep Learning as part of a Dental AI startup for my Masters Thesis.
- Created an end-to-end pipeline, including data collection and labeling, to build a functional model.
- Successfully designed and implemented the prototype, demonstrating proficiency in Deep Learning techniques.
- Demonstrated expertise in working with X-ray imaging and utilizing Deep Learning algorithms for maxillary structure classification.
- Took responsibility for the entire project, ensuring smooth progress from data collection to the development of a fully operational prototype.

Research Engineer
Quelia Systems, Paris France

Aug. 2018 ↑ Jun. 2018

- Developed an application for estimating tire wear during a summer internship.
- Utilized computer vision techniques and a portable mobile camera to measure the depth of tire treads.
- Designed software that enables users to approximate tire wear and make informed decisions regarding tire replacement.
- Contributed to enhancing safety on the road by providing a user-friendly solution for assessing tire conditions.

Startup Founder
Kevin Technology, Rajasthan India

Apr. 2017 ↑ Sept. 2016

- Founded a start-up with a vision to develop surveillance system based on computer vision techniques.

Contact

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Skills

- Artificial Intelligence
- Computational Neuroscience
- Visual reasoning
- Computer Vision
- OpenCV
- Cognitive science
- Attention and Memory process
- Classification
- Transformer Architecture
- Object Detection
- Medical Imaging
- Computer Vision
- Object Detection
- Scene Segmentation
- Python
- Pytorch
- Scikit-Learn
- Numpy
- Pandas
- Problem Solving
- Effective Communication
- Adaptability
- Teamwork

Leadership

- Elected as Student representative for *ANITI*, France
- Elected Member of Senate, *Science and Tech. Council*, LNMIIT, India
- Founder and Membership head, *IEEE Student branch*, LNMIIT, India
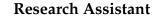
Aug. 2016
↑
Oct. 2014

Assistant Manager

Shree Bherunath Granite, Rajasthan India

- Assisted in establishing granite mines for the family business and assumed a pivotal role in managing the daily operations.
- Supervised a team of 20 employees, ensuring smooth workflow and efficient execution of tasks.
- Implemented strategies and process improvements that positively impacted the overall efficiency and productivity of the team.

Sept. 2014
↑
Sept. 2013

Research Assistant

Indian Institute of Technology, Jodhpur India

- Served as a research assistant at India's prestigious IIT, focusing on the development of lossless video compression techniques.
- Successfully developed innovative methodologies for lossless video compression, contributing to the field of data compression.
- Published research work in a top-tier conference dedicated to data compression, showcasing expertise and recognition within the academic community.

Education

Apr. 2023
↑
Oct. 2019

Doctor of Philosophy

Artificial and Natural Intelligence Toulouse Institute (AN-ITI), France and Brown University, USA

Major: Computational Neuroscience

- Conducted research and identified the challenges faced by machines in performing abstract visual reasoning tasks, highlighting the disparity between human and machine performance.
- Leveraged insights from cognitive science literature, specifically the role of attention and memory, to develop a novel architecture.
- Created a prototype model that successfully combines attention and memory, resulting in improved machine performance in reasoning tasks.
- Contributed to advancing the field of artificial intelligence by addressing the limitations in machine performance in abstract visual reasoning.
- Published papers in prestigious conferences and journals including NeurIPS, ICLR, and Neural Computation, showcasing research contributions and expertise.
- Collaborated with interdisciplinary teams and projects across institutes during the course of the PhD, fostering a collaborative and dynamic research environment.

Sept. 2019
↑
Sept. 2017

Masters of Science

Erasmus Joint Masters with University of Bourgogne (France), University of Girona (Spain) and Heriot-Watt University (U.K.)

Major: Computer Vision and Robotics

- Internships at WeDiagnostiX and Quelia Systems.
- Charpak Masters Scholarship from French Government
- Santander Grant by University of Girona (Spain)
- Erasmus+ Mobility Grant for Masters study abroad by European Commission
- Bourgogne Regional Council Grant
- Completed projects related to the field computer vision, medical imaging and robotics involving tasks such as image classification, scene segmentation, feature detection, image processing.

Voluntary

Reviewer Task

- IEEE Transaction on Evolutionary Computation
- NeurIPS
- CVPR
- ICML
- ECCV

Teaching

At Federal University of Toulouse Midi-Pyrènèes, France

- Introduction to Computer vision
- Visual Reasoning in Computer Vision
- Initiation to research work

Conference Talks

- *International Conference on Learning Representation* (ICLR), Rawanda
- *Geological Society of America*, Connects, Denver (USA)
- *Botany* (virtual)
- *Brown Unconference*, USA

Publication

Selected:

- GAMR: Guided Attention Model of (visual) Reasoning." *The Eleventh International Conference on Learning Representations (ICLR)*
- A Benchmark for Compositional Visual Reasoning. *In Proceedings of the Neural Information Processing Systems (NeurIPS)* Track on Datasets and Benchmarks
- Understanding the Computational Demands Underlying Visual Reasoning. In Special Collection CogNet of *Neural Computation*
- Conviformer: Convolutionally guided Vision Transformer. *ArXiv*
- Residue coding technique for video compression", 24th IEEE *Data Compression Conference (DCC)*

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