Mohammedkaif Mohammedrafiq Kalagond

Department of Data Science and Engineering
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Education

B.S. in Data Science Aug. 2023–Present
Indian Institute of Science Education and Research Bhopal
Department of Data Science and Engineering; CGPA: **9.18/10**.

Pre-University (Physics, Chemistry, Mathematics and Biology) 2020–2022
K. H. Patil Pre-University College, Hirekerur
Percentage: 90%.

Publications & Manuscripts

[1] Rajeev Ranjan Dwivedi*, **Mohammedkaif Rafiq***, Niramay M. Patel, and Vinod K. Kurmi. "Regulating Internal Alignment Flows for Robust Learning Under Spurious Correlations." *International Conference on Learning Representations (ICLR)*, 2026. **Published**. [Paper]

[2] Rajeev Ranjan Dwivedi, **Mohammedkaif Rafiq** , Monika Sharma, and Amit Sangroya. "Equitable Dermatology: Adversarial and Spectral Techniques for Fair Skin Lesion Classification." *Indian Conference on Computer Vision, Graphics and Image Processing (ICVGIP)*, 2025. **Published**. [Paper]

[3] Radhika Khatri, Adinath Dukre, Anastasia Godneva, **Mohammedkaif Rafiq**, Kabir Suhel, Eran Segal, and Imran Razzak. "Chronological-age prediction, long-term stability and prospective host relevance are separable properties of gut microbiome ageing measures." **Submitted to Nature Aging**, 2026.

[4] *Bias-Enhanced Attention for Mitigating Spurious Correlations.* **Submitted to ICLR**, 2027.

[5] *Bias-Free Skin Lesion Classification via Robust Representation Learning.* **Submitted to WSDM**, 2026.

[6] *Mask-Guided Attention for Debiasing Neural Networks.* **Submitted to ICLR**, 2027.

*Equal contribution.

Research Experience

B.S. Thesis Student 2026–Present
VisDom Lab, IISER Bhopal

- Investigating manifold-based latent representations for world models, focusing on representation drift and error accumulation during recursive prediction.
- Studying how latent geometry and dynamics affect the stability of long-horizon predictions.

Research Intern May 2026–Present
Lossfunk

- Investigated bias localisation in vision models through mathematical and empirical analysis of layers and representation subspaces.
- Developed a regulariser to mitigate multiple attribute biases while preserving predictive performance.

Deep Learning Intern May 2025–Present
VisDom Lab, IISER Bhopal; Supervisor: Dr Vinod K. Kurmi

- Researched internal representations of vision and language models, including robustness under distribution shift and multi-step reasoning.
- Designed and evaluated methods addressing biased representations, failure patterns, fairness and reliability.

Research Intern Jul.–Aug. 2025
TCS Research, Remote, India

- Contributed to computer-vision model development and empirical validation; co-authored the ICVGIP 2025 dermatology paper.

- Developed and evaluated adversarial debiasing and representation regularisation for skin-lesion classification across skin-tone groups.

Selected Research Projects

Robust Learning Under Spurious Correlations 2026
Alignment-Gated Suppression (AGS); ICLR 2026

- Co-developed a regularisation approach using internal alignment signals to reduce reliance on spurious features without requiring group labels during training.
- Used class-conditional, confidence-weighted signals, exponential moving averages and percentile-gated weight decay to target harmful learning dynamics.
- Evaluated robustness on Waterbirds, CelebA, BAR and COCO, including conflicting examples and worst-group performance; reported training overhead was under 5%.

Equitable Dermatology 2025
Fair skin-lesion classification; ICVGIP 2025

- Combined gradient-reversal adversarial debiasing with Elastic Representation regularisation to reduce skin-tone dependence in visual features.
- Evaluated ResNet-18 and EfficientNet-B3 on Fitzpatrick17k and ISIC 2020, using ablations to examine each component's contribution.
- Analysed embeddings and attention using t-SNE and Grad-CAM to investigate representation quality across skin-tone groups.

Multi-Agent Medical Reasoning with LLaMA Apr. 2025
Research prototype

- Built a pipeline with seven LLaMA models assigned to domain identification, expert analysis and response summarisation.

Technical Skills

Programming and tools: Python, C, C++, PyTorch, TensorFlow, scikit-learn, NumPy, Git.
Methods: Representation learning, self-supervised learning, CNNs, transformers, foundation models, optimisation, generative modelling.
Research practice: Experimental design, ablation studies, representation analysis, adversarial training, fairness evaluation and distribution-shift analysis.

Relevant Coursework

Machine Learning; Artificial Intelligence; Advanced Deep Learning; Computer Vision; Natural Language Processing; Optimisation; Linear Algebra; Multivariable Calculus; Probability and Statistics.

Academic Service

Reviewer: International Conference on Learning Representations (ICLR) , 2027
British Machine Vision Conference (BMVC), 2026
Indian Conference on Computer Vision, Graphics and Image Processing (ICVGIP), 2026.

Awards and Fellowships

SPAR AI Safety Fellowship, 2026.
Selected for the SPAR fellowship focused on **AI Safety and Alignment** research and professional development.
CODS 2026 Student Travel Grant, 2026.
Awarded a student travel grant to support participation in CODS 2026.
Undergraduate Forum @ IndoML 2026, 2026.
Selected to participate in the Undergraduate Forum at IndoML 2026 based on the submitted application.

Workshops and Activities

3D Modeling and Cloud Data Processing Workshop, IISER Bhopal (2024); Model Solvay Conference, IISER Bhopal (2025).