

# Rahul Vigneswaran

Masters in Computer Science & Engineering (By Research)

Indian Institute of Technology Hyderabad

Reliance Foundation Fellow

Advisor: *Dr Vineeth N Balasubramanian*

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## EDUCATION

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**Indian Institute of Technology, Hyderabad**

India

*Master of Technology in Computer Science & Engineering (By Research) - CGPA: 9.76/10*

*Jan'23 - Dec'25*

## PUBLICATIONS

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- **ECCV 2026** | Under Review |  
**Rahul Vigneswaran**, Divya, Digvijay, Chandana, Vineeth N Balasubramanian.  
**Class Incremental Learning Free of Unrealistic Assumptions.**
- **ACL Rolling Reviews 2026** | Under Review |  
Anubhav Shrimal, **Rahul Vigneswaran**, Stanley, Anish, Promod.  
**Structure Thinking for enhanced reasoning in LLMs.**
- **TMLR 2026 | AAAI (W) 2026** | Paper |  
**Rahul Vigneswaran**, Chandana, Vineeth N Balasubramanian.  
**Transitioning Heads Conundrum: The Hidden Bottleneck in Long-Tailed Class-Incremental Learning.**
- **TMLR 2025** | Paper | Code |  
**Rahul Vigneswaran\***, Kancheti Sai Srinivas\*, Bamdev Mishra, Vineeth N Balasubramanian.  
**HARE: Human-in-the-Loop Algorithmic Recourse.**
- **ICVGIP 2021** | Paper | Code | Video |  
**Rahul Vigneswaran**, Marc T Law, Vineeth N Balasubramanian, Makarand Tapaswi.  
**Feature Generation for Long-tailed Classification.**
- **AAAI 2021** | Paper |  
Adepu Ravi Shankar\*, Yash Khasbage\*, **Rahul Vigneswaran**, Vineeth N Balasubramanian.  
**A Deeper Look at the Hessian Eigen Spectrum of Deep Neural Networks and its Applications to Regularization.**

## RESEARCH EXPERIENCE

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**Applied Scientist Intern**

Amazon, India

*Managers: Promod Yenigalla, Anish Nediyanath, Anubhav Shrimal*

*Mar'25 - Aug'25*

- Developed a new capability for Amazon's internal Agentic assistant (SAPIEN), enabling insight exploration across databases and user files through automatic table identification (**89% accuracy**), context-aware clarification handling, and workflow initiation; demoed to leadership.
- Reduced manual testing effort of SAPIEN (**7×**) by building tools like *Golden Dataset Generator* and *Gamma Testing Framework*, ensuring scalable reliability across use cases.
- Secured a **Top-3 finish** (only intern to do so) at Amazon's internal Hackathon with Promptinator-3000, an automated prompt and dataset generation framework, which achieved **21×** **efficiency gain**, earning recognition from leadership.

★ Under Review: **ACL Rolling Reviews'26.**

**Research Assistant**

IIT Hyderabad, India

*Advisor: Dr Vineeth NB*

*Jan'23 - Dec'25*

- Proposed a new realistic setup in Continual Learning that is free of assumption and developed a novel method using adapters to tackle it, which yields **+8% performance boost**.
- Developed a novel method to tackle Transitioning Head problem in Long-Tailed Class Incremental Learning via Early Knowledge Transfer, achieving state-of-the-art results (**+5% performance**).
- Created a human-in-the-loop recourse framework that integrates user feedback, generating personalized counterfactuals and enhancing user satisfaction and transparency. Achieved a **13× improvement** in metrics compared to baselines.

★ Published: **AAAI'26 (W)**, **TMLR'26**, **TMLR'25**. Under Review: **ECCV'26**

## Research Intern

IIT Hyderabad, India

Advisors: *Dr Vineeth NB (IIT-H)* & *Dr Makarand Tapaswi (IIIT-H)*

July'19 - Jan'23

- Developed TailCalibX, a feature generation technique for Long-Tailed classification that uses calibrated distributions to boost performance on imbalanced datasets, setting a new state-of-the-art.
- Created a Hessian-based regularization method that improves generalization by leveraging the similarity between layerwise and overall Hessians, enhancing regularizer efficiency.

★ Published: **AAAI'21**, **ICVGIP'21**.

## RESEARCH PROJECTS

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### Integration Testing for Stochastic AI systems

May'25 - Aug'25

Advisor : *Anubhav Shrimal (Amazon)*

- Developed an **LLM-based, persona-driven multi-turn evaluation framework** for stochastic AI systems, simulating real user behaviors (waiting, task switching, file uploads) and enabled headless CI/CD integration to produce automated pass/fail signals, improving reliability of validation.

### Adversarially Coupled Prompt & Dataset Generator

March'25 - May'25

Advisor : *Anish Nediyanath (Amazon)*

- Developed an **adversarial co-evolution framework** coupling a prompt generator and dataset generator with access to intermediate reasoning steps, achieving a **21× efficiency gain** by producing robust initial prompts and diverse reasoning-annotated datasets, reducing manual effort and accelerating UAT cycles; earned recognition from leadership.

### AWARE: Adaptive Wear-levelling and Attack Re-mapping Engine

June'24 - Dec'24

Advisor : *Dr Shirshendu Das (IIT-H)*

| [Report](#) |

- Proposed a novel framework that enhances NVM durability and security in LLCs by combining adaptive wear-leveling and attack mitigation through intelligent remapping and workload-aware strategies.

### Large Language Models related Hardware Optimizations

Jan'24 - April'24

Advisors : *Dr Rajesh Kedia* & *Dr Shirshendu Das (IIT-H)*

| [Report](#) |

- Analyzed hardware and software optimizations to improve Large Language Models, identifying gaps like fragmented benchmarking and advocating for unified solutions to boost efficiency.

## ACHIEVEMENTS

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### Reliance Foundation Postgraduate Scholarship

'23 - '25

Awarded to Top 100 Students Nationwide. Scholarship Value: 6 Lakhs

### AAAI Travel Grant Awardee

'26

Competitive grant supporting travel and accommodation to attend AAAI 2026

### Amazon's Internal Hackathon

'25

Top-3. Only Intern Finalist, competing against well-seasoned Applied Scientists & SDEs

## VOLUNTEERING

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### Research

Reviewer: AAAI'26, ECCV'22

Sub-Reviewer: CVPR'23, ICLR'21, IJCAI'20, WACV'23, SDM'21

Student Volunteer: AAAI'26, ACML'22, ICML'20

### Academic TAships

[AI and Emerging Technologies](#) (IIT Hyderabad) ('26, '25, '24, '23, '22)

[Deep Learning for Computer Vision](#) (NPTEL) ('24, '20)

[Effective Teaching of Machine Learning](#) (CSEDU IIIT Delhi) ('22, '21)

[Advanced Topics in Machine Learning](#) (AI 2100 / CS 6360) (IIT Hyderabad) ('21)

## REFERENCES

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- [Dr. Vineeth N. Balasubramanian](#), Principal Researcher, Microsoft Research, India | Professor, IIT-H, India.
- [Promod Yenigalla](#), Sr. Applied Science Manager, Amazon, USA.
- [Anish Nediyanath](#), Sr. Applied Scientist, Amazon, India.
- [Anubhav Shrivastava](#), Sr. Applied Scientist, Amazon, USA.