

# Avani Gupta

[avani17101.github.io](https://avani17101.github.io) | [avani17101@gmail.com](mailto:avani17101@gmail.com) | [Google Scholar](#) | [GitHub: avani17101](#)

## Education

### IIIT Hyderabad

Hyderabad, India

B.Tech (Honours) + Masters By Research in Computer Science & Engineering, 2022

Advisor: Prof. P. J. Narayanan, MS specialization: AI, MS CGPA: 9/10

Thesis: Leveraging Human-Centered Explanations for Model Improvement & Evaluation [Link](#)

## Peer-Reviewed Publications

- **Prototype Guided Backdoor Defense via Activation Space Manipulation<sup>†</sup>**, ICCV 2025.  
Venkat Adithya Amula, Sunayana Samavedam, Saurabh Saini, **Avani Gupta**, P. J. Narayanan.  
[\[paper\]](#) | [\[project page\]](#)
- **CAV Styler: Interpretable & Controllable Style Transfer<sup>†</sup>**, To appear in ICVGIP 2025.  
Sunayana Samavedam, Venkat Adithya Amula, Saurabh Saini, **Avani Gupta**, P. J. Narayanan.
- **Concept Distillation: Leveraging Human-Centered Explanations for Model Improvement** NeurIPS 2023. **Avani Gupta**, Saurabh Saini, P. J. Narayanan. [\[paper\]](#) | [\[project page\]](#)
- **Interpreting Intrinsic Image Decomposition using Concept Activations**, ICVGIP 2022 (Oral + Best Paper). **Avani Gupta**, Saurabh Saini, P. J. Narayanan. [\[paper\]](#) | [\[project page\]](#)
- **Building Trust in Clinical LLMs: Bias Analysis & Dataset Transparency**, EMNLP 2025.  
Svetlana Maslenskova, Clement Christophe, Marco AF Pimentel, Tathagata Raha, Muhammad Umar Salman, Ahmed Al Mahrooqi, **Avani Gupta**, Shadab Khan, Ronnie Rajan, Praveenkumar Kanithi. [\[paper\]](#)
- **Med42 - Evaluating Fine-Tuning Strategies for Medical LLMs: Full-Parameter vs. Parameter-Efficient Approaches**, AAAI FM Symposium 2024.  
Clement Christophe, Praveenkumar Kanithi, Prateek Munjal, Tathagata Raha, Nasir Hayat, Ronnie Rajan, Ahmed Al Mahrooqi, **Avani Gupta**, Muhammad Umar Salman, Marco AF Pimentel, Shadab Khan, Boulbaba Ben Amor. [\[paper\]](#) [\[HuggingFace\]](#)
- **Predicting Business Process Events in Presence of Anomalous IT Events**, CODS-COMAD 2024. **Avani Gupta**, Avirup Saha, Sambit Ghosh, Neelamadhav Gantayat, Renuka Sindhgatta. [\[paper\]](#)
- **CitRet: A Hybrid Model for Cited Text Span Retrieval**, COLING 2022.  
Amit Pandey\*, **Avani Gupta\***, Vikram Pudi. [\[paper\]](#)

## Preprints

- **A survey on Concept-based Approaches For Model Improvement**, **Avani Gupta**, P. J. Narayanan. [arXiv:2403-14566](#)
- **Goal-Oriented Next Best Activity Recommendation using Reinforcement Learning**, Prerna Agarwal\*, **Avani Gupta\***, Renuka Sindhgatta, Sampath Dechu. [arXiv:2305.03219](#)

## Patent

- **Generating organizational goal-oriented & process-conformant recommendation models using artificial intelligence techniques**, [\[US Patent Application\]](#), Status: Pending. Prerna Agarwal, Sampath Dechu, **Avani Gupta**, Renuka Sindhgatta

## Research Experience

### MBZUAI AI Engineer, Research Office

Abu Dhabi, UAE

Jun 2025 - Present

- Translated 10+ real-world industry problems into research formulations & identified relevant faculty collaborators, combined academic grounding with practical feasibility.
- Proposed a new MARL training paradigm aimed at fostering peer learning & survival instincts in AI Models.
- Designed novel peer-learning loss & survival-shaped rewards with promising preliminary results (ongoing).
- Built an Email Assistant agent (prioritization, extraction, drafting, calendar sync) & automated news-generation agents for the Research Office Newsletter (2000+ recipients).

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- Designed LLM-as-judge pipelines for QA correctness, safety, bias evaluations & persona-conditioned synthetic data generation pipelines enabling scalable multi-persona evaluation.

## **ROSHN AI Engineer**

*Abu Dhabi, UAE*

Apr 2024 - Jun 2025

- Trained small LLMs (1-3B parameters, 2T tokens) for efficient edge deployment; proposed a novel MLA+GQA hybrid attention mechanism improving long-context efficiency for coding & tool-centric tasks.
- Built production-scale agents serving 3,000+ users (RAG, SQL, voice-call) using MCP/A2A protocols.
- Developed custom safety stack: content moderation model (self-trained), jailbreak detection, entity anonymization, & hallucination filters.

## **G42 Healthcare AI Research Associate**

*Abu Dhabi, UAE*

Mar 2023 - Apr 2024

- Modelled large-scale EHR sequences & trained a foundation model for patient trajectory prediction (2.2 million records), including chronic disease predictions, personalised medicine recommendation & mortality forecasting.
- Obtained patient embeddings revealing clinical coherence (chronic disease clusters, comorbidities).
- Orchestrated training datasets from 10M+ articles & contributed evaluation pipelines for **Med42** (70B open-source medical LLM achieving 72% on USMLE, AAAI FM Symposium 2024, EMNLP 2025).

## **Centre for Visual Information Technology (CVIT), IIIT Hyderabad Researcher**

*Hyderabad, India*

May 2020 - Mar 2023

- Originated a unified line of work on concept-driven representation learning across interpretability, vision, & graphics as part of my MS thesis.
- Introduced the concept-sensitivity loss (NeurIPS 23) & sensitivity-based disentanglement metric (ICVGIP 22).
- Guided student-led extensions in backdoor defense (ICCV 25) & style transfer (ICVGIP 25).
- Also worked with Prof. Avinash Sharma on temporal consistency in loose clothing animations of 3D Human.

## **IBM Research Research Intern**

*Bangalore, India*

Sep 2022 - Dec 2022

- Developed anomalous IT events prediction using transformers (CODS-COMAD 24).

## **IBM Research Research Intern**

*Bangalore, India*

May 2021 - Aug 2021

- Formulated RL-based next-best-action recommendation for business processes with conflicting objectives; used action masking to handle dynamically evolving action spaces from process flow graphs (Patent; deployed on IBM Business Automation Workflow).

## **Honors & Awards**

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- **Best Paper Award**, ICVGIP 2022 1/400+ papers. [\[Link\]](#)
- **Global Rank 14**, Amazon ML Challenge 2021 3,000+ teams, 12K participants. [\[Link\]](#)
- **National Winner**, Smart India Hackathon 2020 Top 0.1% from 100,000+ teams. [\[Link\]](#)
- **National Winner**, Microsoft Mars Program 2020 Selected from 100,000+ students. [\[Link\]](#)
- **Dean's List** (Top 1% SGPA, Monsoon 2021) & **Merit List** (Top 5% SGPA, Spring 2021), IIIT Hyderabad

## **Service & Leadership**

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- **Reviewer**: NeurIPS 2025; ACL 2024; AAAI 2023.
- **Teaching & Mentorship**: Delivered lectures on **NeRFs**, **GANs**, and **Interpretability** for the 3D Vision Summer School and IIIT-H Computer Graphics courses (2021 - 2022); mentored professionals and conducted tutorials for TalentSprint AI program (2022 - 2023).
- **Workshops & Community Engagement**: Instructor for the **GANs Workshop** [\[GitHub\]](#); organizer of the AICrowd *ML Battleground* challenge (2021) [\[Link\]](#); student volunteer, NeurIPS Deep RL Workshop 2021.
- **Student Organizations**: Events Wing Member, Robotics Club, IIIT Hyderabad.