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Research Interests

Clinical AI · Biomedical Vision-Language Models · Interpretable & Trustworthy ML · Computational Cognition · Computational Biology & Bioinformatics · Software Engineering Research · AI Agents & Cloud-Native Systems

My research applies AI/ML methods to complex scientific, clinical, and software systems problems, with emphasis on interpretable models, trustworthy biomedical AI, reproducible software engineering, and human-centered deployment of AI systems.

Education

PES University

Aug 2021 – Aug 2025

Bachelor of Technology, Computer Science and Engineering

Bangalore, India

- **Specialization:** Machine Intelligence and Data Science
- **Relevant coursework:** Artificial Intelligence & Machine Learning, Data Analytics, Natural Language Processing, Data Structures & Algorithms, Probability & Statistics, Linear Algebra, Operating Systems, Computer Networks, Cloud Computing
- **Teaching:** Teaching Assistant for **Linear Algebra**; Teaching Assistant for **Generative AI & Its Applications**.
- **Award:** Felicitated with the **Immense Contributions to the CSE Department** Award at Convocation for my Teaching Assistantship, leading the largest FOSS community in college, and for being a core member of the Google Developer Student Clubs PES University ECC Club.

Research Experience

Carnegie Mellon University, Xu Lab

Jul 2026 – Present

Collaborative Researcher

Remote

- Collaborating on early-stage research in **medical vision-language models**, with emphasis on interpretability, reasoning, and trustworthy biomedical foundation models.

Georgia Institute of Technology

Jan 2026 – Present

Research Associate, Center for the Study of Systems Biology

Remote

- Working on ML methods at the intersection of computational biology, protein structure prediction, and drug discovery in the Skolnick lab.
- Contributing to research at the interface of high-throughput biological data and interpretable computational models, with applications to systems biology and drug-target identification.

Geisel School of Medicine at Dartmouth

Mar 2026 – Present

Biomedical AI Researcher

Remote

- Developing personalized digital health models for schizophrenia using passive smartphone sensing and ecological momentary assessment (EMA) data to predict short-term fluctuations in negative and cognitive symptoms.
- Built autoencoder-based deep learning models for low-burden, within-person symptom monitoring; resulting work was accepted as an **in-person research poster** at the **ABCT 60th Annual Convention 2026**.

University of Illinois Urbana-Champaign

June 2025 – Present

Software Engineering Researcher, MIR Group (PI: Prof. Darko Marinov)

Remote

- Selected to the UIUC+ Summer Undergraduate Research in Software Engineering cohort: ranked among the **top 15 out of 1,300+ applicants** through multi-stage review.
- Co-authored an **ISSTA 2026 accepted full paper** studying reproducibility and evidentiary rigor in bug-reporting claims across ISSTA 2025 papers; contributed to dataset curation, manual verification, and analysis of reported bugs, artifacts, and open-source issue evidence.
- Worked on **fairness testing in ML systems**: synthesized ICSE/FSE literature on fairness, bias mitigation, and intersectional testing; explored symbolic execution and local explainability techniques for multimodal ML systems.

Indian Institute of Technology, Hyderabad

June 2023 – Dec 2023

Machine Learning Research Intern

Hyderabad, India

- Used **PySCENIC** to analyze single-cell RNA-seq data and predict **gene regulatory networks**.
- Integrated ML algorithms and decision trees for predictive modeling of gene regulatory interactions.
- Selected as one of **40 students nationwide** for the 15-day ACM India & IIT Hyderabad Summer School on Algorithmic Techniques in Computational Biology.

Publications & Preprints

Kim, J. Y., Dragovic, J., Botta, A., Islam, T. M. R., Mohamad, A., Sharaf, K., Siddiqui, S. S., Joshi, D., **Anand, H.**, et al. *The Discreet Charm of the Bugeoisie*. Proceedings of the 35th ACM SIGSOFT International Symposium on Software Testing and Analysis (ISSTA), 2026. **Accepted full paper; acceptance rate: 23.6%.**

Anand, H. et al. *AIxHealth at Interactive Health: Fostering a Global Research-Practice Collective on Responsible AI and Health Equity*. ACM Interactive Health 2026 Workshop, 2026. **Accepted workshop paper.**

Anand, H., H. K. Varuni, and Gowri Srinivasa. *Gamifying Reality Orientation for Personalized Dementia Support for Senior Citizens*. ACM Celebration of Women in Computing: womENcourage 2026 Posters, 2026. **Accepted poster.**

Langener, A. M., **Anand, H.**, Lee, A., Ross, M., Yan, T., Dorris, H., and Jacobson, N. C. *Using Autoencoder-Based Personalized Models to Predict Symptom Fluctuations in Schizophrenia from Passive Smartphone Data*. ABCT 60th Annual Convention, 2026. **Accepted in-person research poster.**

Anand, H. et al. *Exploring the Influence of Music on Psychological Stress using Machine Learning and XAI Techniques*. Proceedings of the 17th International Conference on Agents and Artificial Intelligence (ICAART), 2025. [\[Paper\]](#)

Anand, H. et al. *Empirical Study of Financial BERT Models for Sentiment Analysis and Cryptocurrency Price Correlation*. Proceedings of the 9th International Conference for Convergence in Technology (I2CT), IEEE, 2024. [\[Paper\]](#)

Anand, H. *Exploring Pivotal Dynamics of the Technological Job Market Through Data Analysis*. engrXiv preprint. [\[Preprint\]](#)

Anand, H. *Applications of Quantum Technology in Healthcare Industry*. engrXiv preprint. [\[Preprint\]](#)

Anand, H. *World of Reinforcement Learning*. engrXiv preprint. [\[Preprint\]](#)

Invited Keynotes, Talks & Presentations

Technical Speaker, MCP Developers Summit, Linux Foundation / Agentic AI Foundation, 2026 — Delivered technical keynote on eBPF telemetry, MCP tool interfaces, kernel-aware debugging, sidecar-free observability, and production failure modes in agentic systems.

Invited Speaker, Bangalore Data Lakehouse Meetup, Cloudera / e6data / OLake by Datazip, 2026 — *Talk to Your Lakehouse: Building a Model Context Protocol Server for Apache Iceberg*. Presented on MCP tool design for Iceberg REST Catalogs, live schema discovery, metadata trimming, auth boundaries, and safe agentic data access.

Speaker, KubeCon + CloudNativeCon Europe 2026, Amsterdam — Presented cloud-native systems work to the Kubernetes and CNCF community.

Youngest Speaker, KubeCon + CloudNativeCon India 2025 — Presented Kubernetes developer tooling and testing practices for watsonx.data; selected as the youngest speaker and only intern speaker from the team.

Paper Presenter, ICAART 2025 — Presented peer-reviewed work on explainable AI for stress prediction.

Other invited talks: IndiaFOSS, Apache Beam @ Google, WHPC Purdue, Women Who Go, IIT Madras, Intuit, FOSS United, Microsoft Research.

Academic & Professional Service

Program Committee Member, AAAI/ACM Conference on AI, Ethics, and Society (AIES 2026) — Reviewed interdisciplinary submissions at the intersection of AI systems, ethics, governance, privacy, hallucination, and societal impact.

Reviewer, ICLR 2026 MemAgents Workshop — Reviewed workshop submissions on memory-augmented agents, LLM systems, and agentic AI architectures.

Reviewer, GopherCon US 2026 — Reviewed technical proposals in Go, cloud-native systems, and developer tooling.

Reviewer, PEARC Conference Series 2026, Posters & Visualizations Track — Reviewed submissions in advanced research computing and scientific computing practice.

Editor & Writer, Last Week in Kubernetes Dev (LWKD), 2026 – Present — Advanced from contributor/writer to editor within **2 months**; curate, edit, and summarize upstream Kubernetes development activity for a global open-source audience.

Industry Experience

IBM		Aug 2025 – Present
Software Developer, Data & AI (watsonx.data)		Bangalore, India
- Promoted through a double-band advancement in recognition of sustained technical ownership, business impact, cross-team leadership, and cloud-native infrastructure contributions. - Built cloud-native infrastructure and developer tooling for IBM watsonx.data, working across Kubernetes, Go, ArgoCD/GitOps, OpenSearch, FedRAMP compliance, and AI infrastructure operations. - Drove infrastructure cost optimization by reducing File and Block Storage expenditure by 90% (\$820 to \$70/month) through forensic Persistent Volume analysis, owner validation, and safe formation cleanup. - Contributed to security-critical initiatives including FedRAMP baseline CVE remediation, DAST/UI scans for OpenSearch tech preview, and hardened packaging for HSCP components. - Resolved 100+ cross-team infrastructure blockers and was selected among the top 50 high-performing contributors for leadership visibility, strategic initiatives, and technical roundtables.		
IBM		Jan 2025 – July 2025
Software Developer Intern, Data & AI (watsonx.data)		Bangalore, India

- Built internal Kubernetes tooling in **Go** using client-go, dynamic clients, and API machinery to simplify CRD operations across cloud environments.
- Contributed to watsonx.data SaaS and deployment workflows across Spark, Iceberg, Kubernetes, and infrastructure services.

Niramai Health Analytix

Jan 2024 – July 2024

Software Developer Intern

Bangalore, India

- Worked on a clinical women's-health application for **breast cancer screening**; built 20 features over 5 months with the product team using Flutter and Firebase.
- Integrated self-examination and tracking tools for predictive analytics on health metrics; implemented secure PII handling with unique patient-ID generation, contributing to a **40% increase** in user engagement and screening compliance.

Community Leadership, Mentoring & Public Scholarship

Mentor, Women in High Performance Computing (WHPC), Jan 2026 – Present — Mentor early-career and aspiring professionals in the HPC ecosystem through structured guidance on technical development, research direction, confidence-building, and career navigation.

Mentor, Sitara Akka, 2025 – Present — Part of a volunteer mentoring collective that has supported **300 students over 8 months** through academic, career, and personal-development guidance, including support for students navigating difficult circumstances.

APAC Ambassador, Women in Data Science (WiDS) Worldwide, Stanford University, Nov 2021 – Present — Selected as WiDS Bengaluru Ambassador and recognized as a **High Impact Ambassador** in the Asia-Pacific region; among the youngest WiDS Ambassadors in APAC.

Head, Hackerspace PES University, 2023 – 2025 — Led the largest technical/FOSS community on campus; organized workshops, hackathons, peer-learning programs, and student-led technical initiatives.

Volunteer, Women Who Code, Dec 2021 – Present — Contributed to women-in-tech community programming and peer learning initiatives.

Volunteer, GirlsCodeIt, Jan 2022 – Present — Supported early exposure to coding, technology learning, and representation-focused STEM initiatives.

Technical Content, Public Scholarship & Strategy

Illuminate AI

Sep 2024 – Present

Chief Content Officer / Content Strategist

Remote

- Lead content strategy across videos, blogs, tutorials, courses, newsletters, and social platforms for Illuminate AI's **1M+ global AI/data community**.
- Develop content calendars and platform-specific strategy for Instagram, YouTube, LinkedIn, Substack, and long-form educational content focused on AI, machine learning, data science, personal branding, immigration, and career growth.
- Collaborate with the founder to align technical content with audience interests, business goals, brand partnerships, and community-learning outcomes.
- Support brand partnership strategy and sponsored technical storytelling for AI and education-focused partners, including collaborations with brands such as **OpenAI** and **Teachable**.
- Research emerging AI/data trends, audience preferences, and platform analytics to optimize content for engagement, viewership growth, educational value, and community impact.

swiftieintech

Dec 2024 – Present

Founder & Writer

Remote

- Founded and write a Data & AI newsletter for a global community of **2,000+ members**, translating technical developments in AI, machine learning, data science, and cloud-native systems into accessible learning resources.
- Publish technical and career-focused essays, explainers, and learning guides for students, early-career technologists, and AI practitioners navigating research, engineering, and applied AI careers.

Freelance

Jul 2024 – Present

Technical Content Writer

Remote

- Write and publish technical blogs on data science, machine learning, and practical AI applications, making complex concepts accessible for broader technical audiences.
- Collaborate on technical content series including *Breakdown the BMC: AI Innovator's Playbook*, focused on applied AI, business models, and emerging technology strategy.

Selected Projects

Project ROOTS — Cognitive intervention for delaying dementia onset · *Flutter, Firebase* · [\[Repo\]](#) **Jan 2022 – Dec 2024**

- Developed a personalized cognitive-games application for delaying dementia onset in elderly users; implemented adaptive memory-reinforcement algorithms tailored to individual cognitive baselines.
- Deployed to **350+ users** across the state, investigating whether personalized cognitive game sequences could meaningfully delay cognitive decline.
- Awarded **Cisco ThingQbator Cohort 5** national grant with **INR 5 lakh seed funding**.
- Resulting work on personalized dementia support was accepted as a research poster at **ACM womENcourage 2026**.

Restaurant Recommendation System · *K-Means, TF-IDF, Collaborative Filtering, Cosine Similarity* **Jan 2023 – Mar 2023**

- Built an end-to-end recommendation pipeline using clustering, TF-IDF, collaborative filtering, and cosine similarity for personalized restaurant recommendations.
- Awarded the **Google KaggleX \$1,000 grant** and 4-month global mentorship.

Honors, Scholarships & Recognition

LinkedIn Top Voice — **Data Science**, 2025.

High Impact APAC Ambassador, Stanford Women in Data Science Worldwide.

OxML Scholar — merit-accepted to the Oxford Machine Learning Summer School.

Harvard WECODE Tech Fellow.

AWS AI & ML Scholar (\$4,000, Intel/Udacity).

IBM Quantum Scholar — Qubit by Qubit / IBM Quantum scholarship.

Technical Skills & Open Source

Languages: Python, R, SQL, Go, C, MATLAB, Bash, JavaScript, HTML5/CSS

ML & Data: PyTorch, TensorFlow, Scikit-learn, Pandas, NumPy, Keras, HuggingFace, NLTK, Jupyter

Biomedical AI & Computational Biology: PySCENIC, single-cell RNA-seq analysis, gene regulatory network inference, interpretable ML, medical VLM literature synthesis

Cloud-Native & Infrastructure: Kubernetes, Docker, ArgoCD, Helm, OpenShift/ROKS, IBM Cloud, GitHub Actions, Jenkins, JIRA, REST APIs

Agentic AI & Systems: Model Context Protocol, AI agents, eBPF observability concepts, tool-call auditing, lakehouse agent interfaces, Apache Iceberg REST Catalogs

Open Source: Contributor, Editor, and Writer for [kubernetes-sigs/lwkd](#); contributor to Kubernetes community documentation, release, and ecosystem-tracking efforts.