Priyadarshini K

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RESEARCH INTERESTS

Foundation models, **Natural language processing**, **Generative AI**, **Knowledge graph embedding**, **Data-efficient machine learning - Active and transfer learning**

WORK EXPERIENCE

Apple Health
SENIOR ML SCIENTIST — September 2024 – Present

- Leading end-to-end development of consumer health AI features using on-device generative models.
- Designing data generation and evaluation pipelines to accelerate model iteration cycles.
- Managing large-scale data annotation efforts, including synthetic data creation and human validation in partnership with external vendors.
- Collaborating with cross-functional partners, including Clinical, Design, and Platform teams.
- Fine-tuning domain-specific LLMs for personalized, privacy-focused on-device health applications.

Sony AI
Senior Research Scientist — September 2021 – August 2024

- Led research initiatives in multimodal machine learning, advancing core areas like olfactory perception modeling, temporal hypothesis generation, and bias mitigation in deep neural network.
- Created and benchmarked synthetic datasets for evaluating explainability and robustness in knowledge graph tasks, enabling reproducible and controlled experimentation.
- Published research in top-tier AI conferences and journals, demonstrating improvements in generalization, data efficiency, and fairness across diverse real-world settings.

IIT Bombay
Research Scholar — August 2015 – July 2021

- Completed Ph.D. research focused on label-efficient distance metric learning
- Designed and implemented machine learning frameworks to model and synthesize multisensory perception systems, spanning vision, haptics, speech, olfaction, and taste.
- Developed active learning algorithms to reduce supervision needs in data-scarce modalities like haptics, improving annotation efficiency in downstream perception tasks.

CitiBank
Risk Analyst July 2013 – October 2014

– Optimized a large-scale Monte Carlo simulation framework, cutting compute time by 50% and reducing hardware and operational costs by up to $65M annually.

EDUCATION

Indian Institute of Technology Bombay 2016 - 2021
Ph.D. in Electrical Engineering
Thesis: *Label-Efficient Distance Metric Learning*
Advisor: Prof. Subhasis Chaudhuri and Prof. Siddhartha Chaudhuri

Indian Institute of Technology Bombay 2011 - 2013
Masters in Electrical Engineering
Thesis: *Multimodal Rendering of 3D Objects at Different Scales*

AWARDS AND HONORS

– TCS Ph.D. Research Fellowship for 4 years (2016 - 2019)

– Qualcomm Innovation Fellowship Finalist, 2019

– Department Excellence in Teaching Assistantship (TA), 2018

– Recipient of MHRD PhD Fellowship 2016

– Recipient of MHRD Post-Graduate fellowship 2011

PATENT

US20250134445A1 - Apparatuses for predicting and using olfactory profiles 2025.

PUBLICATIONS

1. Uchenna Akujuobi, **Priyadarshini K**, Jihun Choi, Samy Badreddine, Kana Maruyama, Sucheendra K. Palaniappan and Tarek R. Besold. Link Prediction for Hypothesis Generation: An Active Curriculum Learning Infused Temporal Graph-Based Approach, Artificial Intelligence Review 2024
2. Rajeev Ranjan Dwivedi, **Priyadarshini Kumari**, Vinod K Kurmi. CosFairNet:A Parameter-Space based Approach for Bias Free Learning, BMVC 2024
3. Pablo Sanchez Martin, Tarek Besold, and **Priyadarshini K**. FRUNI and FTREE synthetic knowledge graphs for evaluating explainability, NeurIPS XAIA 2023
4. Daniel Shin, Gao Pei, **Priyadarshini K**, and Tarek Besold. Optimizing Learning Across Multimodal Transfer Features for Modeling Olfactory Perception, Multimodal SIGKDD 2023. The extended version is currently undergoing for the journal review process.

5. **Priyadarshini K**, Tarek Besold and Michael Spranger. Perceptual metrics for odorants: learning from non-expert similarity feedback using machine learning, PLOS One 2023
6. Tanoy Debnath, Samy Badreddine, **Priyadarshini K** and Michael Spranger. Comparing molecular representations, e-nose signals, and other featurization, for learning to smell aroma molecules, PLOS One, 2023
7. **Priyadarshini K** and Subhasis Chaudhuri. Enhancing Haptic Distinguishability of Surface Materials with Boosting Technique. IEEE Haptics Symposium 2022
8. **Priyadarshini K**, Siddhartha Chaudhuri, Vivek Borkar and Subhasis Chaudhuri. A unified batch selection policy for active metric learning, ECML-PKDD , 2021
9. **Priyadarshini K**, Ritesh Goru, Siddhartha Chaudhuri, and Subhasis Chaudhuri. Batch Decorrelation for Active Metric Learning, IJCAI-PRICAI, 2020.
10. **Priyadarshini K**, Siddhartha Chaudhuri, and Subhasis Chaudhuri. PerceptNet: Learning Perceptual Similarity of Haptic Textures in Presence of Unorderable Triplets. IEEE World Haptics Conference (IEEE WHC), 2019.
11. **Priyadarshini K** and Subhasis Chaudhuri. Haptic Rendering of Thin, Deformable Objects with Spatially Varying Stiffness. EuroHaptics, 2016.
12. Praseedha K., Sreeni K., **Priyadarshini K**, Subhasis Chaudhuri. Combined Hapto-Visual and Auditory Rendering of Cultural Heritage Objects. Asian Conference on Computer Vision (ACCV) e-Heritage Workshop, 2014.
13. **Priyadarshini K**, Sreeni K.G. and Subhasis Chaudhuri. Scalable Rendering of Variable Density Point Cloud Data. IEEE World Haptics Conference (IEEE WHC), 2013.
14. Sreeni K.G., **Priyadarshini K**, A.K. Praseedha and Subhasis Chaudhuri. Haptic Rendering of Cultural Heritage Objects at Different Scales. EuroHaptics, 2012.

BOOK CHAPTER

Subhasis Chaudhuri and **Priyadarshini Kumari**. Cultural Heritage Object: Bringing Them Alive Through Virtual Touch, *Digital Hampi: Preserving Indian Cultural Heritage*, Springer, 2018.

PROFESSIONAL ACTIVITIES

- Senior program chair for WiML un-workshop @ ICML 2023
- Area chair for WiML workshop @ NeurIPS 2022
- Session chair for ECML-PKDD 2021
- Group mentor @GHC 2022
- Reviewer @ IJCAI, ECML-PKDD, Neurips, ISMAR, IEEE WHC, IEEE Haptics Symposium, EuroHaptics

Talks

- August 2023: @ Sony Tech Talk, Virtual
- August 2023: @ Multimodal SIGKDD 2023, Longbeach, CA
- July 2023: @ WiML Un-workshop ICML 2023, Hawaii
- July 2023: @ 3rd Nobel Turing Workshop, CMU Pittsburgh PA
- May 2023: @ Sony Journal Club, Virtual
- March 2022: @ IEEE Haptics Symposium 2022, Virtual
- Jan 2022: @ Sony Journal Club, Virtual
- October 2021: @ PhD defense, IIT Bombay
- July 2021: @ Sony, Tokyo
- September 2021: @ ECML-PKDD 2021, Virtual
- March 2021: @ Qualcomm Innovation Fellowship, Bangalore
- January 2021: @ IJCAI 2020, Virtual

  (older talks not listed)

TEACHING

Wavelet - Spring 2020, Computer Vision - Spring 2016, Spring 2017, Spring 2018, Statistical Signal Analysis - Fall 2019, Digital Signal Processing - Spring 2019, Signals and System - Fall 2017, Fall 2018, Communication Lab - Fall 2016