Priyadarshini K

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RESEARCH INTERESTS

Multimodal learning, **Natural language processing**, **Generative models**, **Knowledge graph embedding**, **Graph representation learning**, **Data-efficient machine learning - Active and transfer learning**

My research focuses on developing scalable, data-efficient large language models (LLM and ML models in general) that continually learn, adapt, and ensure interpretability in their predictions. So far, my work has spanned diverse applications, including biomedical hypothesis generation and recommendation system design. Recognizing the pivotal role of reasoning in these contexts, I also explore innovative approaches to augment the reasoning abilities of these models to support their predictions.

WORK EXPERIENCE

- *Research Scientist II,* **Sony Research** — Dec 2023 - present
- *Research Scientist,* **Sony Research** — Sept 2021 - Dec 2023
- *Project Research Engineer,* **IIT Bombay** — Aug 2015 - Dec 2015
- *Risk Analyst,* **CitiCorp Service India Ltd, Pune** — Jul 2013 - Oct 2014

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

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 (under review at Artificial Intelligence Review")
2. Pablo Sanchez Martin, Tarek Besold, and **Priyadarshini K**. FRUNI and FTREE synthetic knowledge graphs for evaluating explainability, NeurIPS XAIA 2023
3. 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.
4. **Priyadarshini K**, Tarek Besold and Michael Spranger. Perceptual metrics for odorants: learning from non-expert similarity feedback using machine learning, PLOS One 2023
5. 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
6. **Priyadarshini K** and Subhasis Chaudhuri. Enhancing Haptic Distinguishability of Surface Materials with Boosting Technique. IEEE Haptics Symposium 2022
7. **Priyadarshini K**, Siddhartha Chaudhuri, Vivek Borkar and Subhasis Chaudhuri. A unified batch selection policy for active metric learning, ECML-PKDD , 2021
8. **Priyadarshini K**, Ritesh Goru, Siddhartha Chaudhuri, and Subhasis Chaudhuri. Batch Decorrelation for Active Metric Learning, IJCAI-PRICAI, 2020.
9. **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.
10. **Priyadarshini K** and Subhasis Chaudhuri. Haptic Rendering of Thin, Deformable Objects with Spatially Varying Stiffness. EuroHaptics, 2016.
11. 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.
12. **Priyadarshini K**, Sreeni K.G. and Subhasis Chaudhuri. Scalable Rendering of Variable Density Point Cloud Data. IEEE World Haptics Conference (IEEE WHC), 2013.
13. 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.

MASTERS THESIS

Multimodal Rendering of 3D Objects at Different Scales: Developed a **multimodal rendering** technique to synthesize a *hapto-visual-auditory* perceptual experience of interaction with 3D model of objects. The goal of this project was to provide access to the heritage objects to visually-impaired people.

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