

Priyadarshini K

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RESEARCH INTERESTS

Multisensory Perception Modeling, Data-Efficient Representation Learning, Distributed machine learning, Uncertainty Estimation

My research is motivated by the goal of *modeling* and *synthesizing* a multisensory (vision, speech, haptic, olfaction, and taste) perception system using ML tools. To achieve data efficiency, I also work on developing *active learning* algorithms to reduce the annotation load in supervised methods. So far, I've applied my research primarily in computer vision and haptics applications, such as object retrieval, recommendation systems, and haptic texture recognition, but I've also been motivated by other machine senses such as olfaction and taste.

APPOINTMENTS

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| – <i>Research Scientist, Sony AI, Tokyo</i> | Sept 2021 - present |
| – <i>Project Research Engineer, IIT Bombay</i> | Aug 2015 - Dec 2015 |
| – <i>Risk Analyst, CitiCorp Service India Ltd, Pune</i> | Jul 2013 - Oct 2014 |
| – <i>Research Associate, IIT Bombay</i> | Jul 2010 - Jun 2013 |

EDUCATION

Indian Institute of Technology Bombay Ph.D. in Electrical Engineering Thesis: <i>Label-Efficient Metric Learning</i> Advisor: Prof. Subhasis Chaudhuri and Prof. Siddhartha Chaudhuri	2016 - 2021
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Indian Institute of Technology Bombay Masters in Electrical Engineering Thesis: <i>Multimodal Rendering of 3D Objects at Different Scales</i>	2011 - 2013
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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. **Priyadarshini K** and Michael Spranger. Perceptual metrics for odorants: learning from non-expert similarity feedback using machine learning(under submission)
2. Tanoy Debnath, Samy Badreddine, **Priyadarshini K** and Michael Spranger. Comparing molecular representations, e-nose signals, and other featurization, for learning to smell aroma molecules(under submission)
3. **Priyadarshini K** and Subhasis Chaudhuri. Enhancing Haptic Distinguishability of Surface Materials with Boosting Technique. IEEE Haptics Symposium 2022
- 4.* **Priyadarshini K**, Siddhartha Chaudhuri, Vivek Borkar and Subhasis Chaudhuri. A unified batch selection policy for active metric learning, ECML-PKDD , 2021
- 5.* **Priyadarshini K**, Ritesh Goru, Siddhartha Chaudhuri, and Subhasis Chaudhuri. Batch Decorrelation for Active Metric Learning, IJCAI-PRICAI, 2020.
- 6.* **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.
7. **Priyadarshini K** and Subhasis Chaudhuri. Haptic Rendering of Thin, Deformable Objects with Spatially Varying Stiffness. EuroHaptics, 2016.
8. 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.
9. **Priyadarshini K**, Sreeni K.G. and Subhasis Chaudhuri. Scalable Rendering of Variable Density Point Cloud Data. IEEE World Haptics Conference (IEEE WHC), 2013.
10. 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

- **Summary:** Developed a **multimodal rendering** technique to synthesize a combined *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.
- **Domains involved:** Image Processing, Computer Graphics, Computer Vision, Haptic Signal Processing.

PROFESSIONAL ACTIVITIES

- Area chair for WiML workshop @ NeurIPS 2022
- Session chair for ECML-PKDD 2021
- Reviewer: IEEE World Haptic Conference, ECML-PKDD, IJCAI, Eurohaptics

TEACHING

Teaching Assistant

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]