D H R U V V E R M A

Department of Computer Science, University of Toronto
40 St. George St, Toronto, ON, Canada

www.dhruv-verma.com dhruvverma@cs.toronto.edu Dhruv Verma

RESEARCH INTERESTS

Human-Computer Interaction, Ubiquitous Computing, Mobile Health, Computational Imaging

EDUCATION

University of Toronto | Toronto, Canada 2021 - Present
Ph.D. in Computer Science - Advisor: Alex Mariakakis

Indraprastha Institute of Information Technology Delhi | Delhi, India 2017 - 2021
B.Tech in Computer Science & Engineering

PEER-REVIEWED PUBLICATIONS

6. **Dhruv Verma**, et al. Hyperspectral Imaging on Everyday Cameras. **[Under Submission]**

5. **Dhruv Verma**, Sejal Bhalla, Sai Santosh, Saumya Yadav, Aman Parnami, and Jainendra Shukla. 2023. AttentioNet: Monitoring Student Attention Type in Learning with EEG-Based Measurement System. In Proceedings of the 11th IEEE International Conference on Affective Computing and Intelligent Interaction (ACII'23). To appear

4. Vimal Mollyn, Karan Ahuja, **Dhruv Verma**, Chris Harrison, and Mayank Goel. 2022. SAMoSA: Sensing Activities with Motion and Sub-Sampled Audio. In Proceedings of the ACM on Interactive Mobile Wearable & Ubiquitous Technologies (IMWUT'22). https://doi.org/10.1145/3550284

3. **Dhruv Verma**, Sejal Bhalla, Dhruv Sahnan, Jainendra Shukla, and Aman Parnami. 2021. ExpressEar: Sensing Fine-Grained Facial Expressions with Earables. In Proceedings of the ACM on Interactive Mobile Wearable & Ubiquitous Technologies (IMWUT'21). https://doi.org/10.1145/3478085

2. **Dhruv Verma**, Kshitij Gulati, Vasu Goel, and Rajiv Ratn Shah. 2020. Fashionist: Personalising Outfit Recommendation for Cold-Start Scenarios. In Proceedings of the 28th ACM International Conference on Multimedia (MM'20). https://doi.org/10.1145/3394171.3414446

1. **Dhruv Verma**, Kshitij Gulati, and Rajiv Ratn Shah. 2020. Addressing the Cold-Start Problem in Outfit Recommendation Using Visual Preference Modelling. In Proceedings of the IEEE International Conference on Multimedia Big Data (BigMM'20). https://doi.org/10.1109/BigMM50055.2020.00043

RESEARCH EXPERIENCE

Applied Scientist Intern | Amazon Lab126 — Jul 2022 - Oct 2022
Halo Health Technology Group, Mentored by Dr. Hongda Mao
- Improved hand gesture recognition algorithm using contrastive learning.

Graduate Research Assistant | University of Toronto — Sep. 2021 - Present
Computational Health and Interaction (CHAI) Lab, Advised by Dr. Alex Mariakakis
- Developing an accessible solution for hyperspectral imaging using low-cost hardware and computational imaging algorithms.

Visiting Student Researcher | Carnegie Mellon University — Jun 2020 - May 2021
Smart Sensing for Humans (SMASH) Lab, Advised by Dr. Mayank Goel
- Implemented a novel privacy-preserving activity recognition system using inertial and subsampled audio data (sampled at less than 1 kHz).

Undergraduate Research Assistant | IIIT Delhi — Dec 2018 - May 2021
Weave Lab & HMI Lab, Advised by Dr. Aman Parnami & Dr. Jainendra Shukla
- Designed and implemented a novel facial expression recognition system leveraging inertial sensors on wireless earbuds.
- Developed a novel framework for integrating human mental states, such as affect and cognition into context-aware applications.

SKILLS

Programming Languages	Python, Java, C++
Frameworks and Tools	TensorFlow, Keras, Scikit-learn, OpenCV, PyLops, CVXPy, Pandas, NumPy, Matplotlib, SciPy, Librosa, Android Studio, Arduino, Processing, PsychoPy, LaTeX.
Sensing	Activity Recognition (Acoustic, Motion), Gesture Recognition (Motion, Optical), Speech and Audio Sensing (Acoustic), Physiological Sensing (EEG, HR, SpO2), Hyperspectral Imaging (Optical).
Additional Skills	Signal and Image Processing, Experimental Design, Human-Centered Design, Rapid Prototyping, Quantitative Data Analysis.

AWARDS & HONORS

ACM Gary Marsden Travel Award ($2500 USD)	May 2023
University of Toronto, Program-Level Fellowship ($1000 CAD)	Nov 2022
Alberta Machine Intelligence Institute AI Week Talent Bursary ($1500 CAD)	May 2022
University of Toronto Program-Level Fellowship ($1000 CAD)	Nov 2022
Mitacs Globalink Research Internship Award ($6000 CAD)	Apr 2020

ACADEMIC SERVICE

Lead Editor, ACM XRDS (formerly Crossroads) Magazine — Winter 2022
Feature Editor, ACM XRDS (formerly Crossroads) Magazine — 2021 - Present
Reviewer, ACM IMWUT, ACM MobileHCI — 2021, 22
Student Volunteer, ACM Ubicomp/ISWC, ACM UIST — 2020, 21

TEACHING EXPERIENCE

Teaching Assistant, University of Toronto | Computing for Medicine — 2022, 23
Teaching Assistant, University of Toronto | Design of Interactive Computational Media — Winter 2022
Teaching Assistant, University of Toronto | Introduction to Image Understanding — Fall 2021
Teaching Assistant, IIIT Delhi | Privacy and Security in Online Social Media — Winter 2021
Teaching Assistant, IIIT Delhi | Prototyping Interactive Systems — Fall 2019

VOLUNTEERING & OUTREACH

Mentor - Pursue STEM | University of Toronto — Apr 2022 - May 2022

- I served as a mentor for a team of two female students from underprivileged communities, sharing my expertise in programming and sensing. We developed a project related to the idea of a "smart refillable water bottle". We showcased our prototype at the Canadian Black Scientist Network Science Fair 2022 for high school students.

REFERENCES

Alex Mariakakis (Assistant Professor, University of Toronto)
Mayank Goel (Assistant Professor, Carnegie Mellon University)
Aman Parnami (Assistant Professor, IIIT Delhi)
Jainendra Shukla (Assistant Professor, IIIT Delhi)

- Last updated: Oct 1, 2023 -