

# HARSHVARDHAN TAKAWALE

*email:* htakawal@umd.edu  $\diamond$  *website:* harshvardhan-takawale.github.io  $\diamond$  *Phone :* +1 240 854 8549

## RESEARCH INTERESTS

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Spatial Acoustics, Physics-informed Machine Learning, Multimodal imaging, RF sensing, Ambient Computing, Ubiquitous Healthcare, Low-power Learning Systems

## EDUCATION

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**University of Maryland, College Park**

2022 -

Ph.D. in Computer Science

Advisor - Dr. Nirupam Roy

**Birla Institute of Technology and Science, Pilani**

2016 - 2020

Bachelor of Engineering in Electrical and Electronics

Minor in Data Science

## PUBLICATIONS

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- **INFER : Learning Implicit Neural Frequency Response Fields for Confined Car Cabin** (*link*)  
Harshvardhan Takawale, Nirupam Roy, Phil Brown  
(ICML 2026)
- **Spectral Domain Neural Reconstruction for Passband FMCW Radars** (*link*)  
Harshvardhan Takawale, Nirupam Roy  
(Under Review - NeurIPS 2026)
- **Sparse is Fast: Accelerating Synthetic Aperture Sonar via Reduced Sampling** (*link*)  
Yang Bai, Harshvardhan Takawale, Aritrik Ghosh, Nirupam Roy  
(GetMobile 2026)
- **LITE: Loss-resilient Immersive Telepresence with Multi-modal Semantics**  
Ruizhi Cheng, Harshvardhan Takawale, Nan Wu, Nirupam Roy, Sennur Ulukus, Matteo Varvello, Eugene Chai, Bo Han  
(Under Review - MobiCom 2026)
- **Towards Detecting Auditory Attention from in-Ear Muscle Contractions using Commodity Earbuds** (*link*)  
Harshvardhan Takawale, Yang Liu, Khaldoon Al-Naimi, Fahim Kawsar, Alessandro Montanari  
(ICASSP 2025)
- **Learning Speaker-Listener Mutual Head Orientation by Leveraging HRTF and Voice Directivity on Headphones** (*link*)  
Harshvardhan Takawale, Nirupam Roy  
(ICASSP 2024)

- **Scribe: Simultaneous Voice and Handwriting Interface** (*link*)  
Yang Bai, Irtaza Shahid **Harshvardhan Takawale** and Nirupam Roy  
(IMWUT 2024)
- **Structure Assisted Spectrum Sensing for Low-power Acoustic Event Detection** (*link*)  
Nakul Garg, **Harshvardhan Takawale**, Yang Bai, Irtaza Shahid and Nirupam Roy  
IASA CPS IoT Week 2023
- **Poster: Natural Voice Interface for the Next Generation of Smart Spaces** *link*  
Yang Bai, Nakul Garg, **Harshvardhan Takawale**, Anupam Das and Nirupam Roy  
24rd HotMobile 2023
- **A Seamless Second-Factor Verification as a Mobility-Service for Future Commute Stations** (*link*)  
**Harshvardhan Takawale**, Jay Prakash and Tony Quek  
23rd HotMobile 2022
- **Malware Detection on Highly Imbalanced Data through Sequence Modeling** (*link*)  
Rajvardhan Oak, Min Du, David Yan, **Harshvardhan Takawale** and Idan Amit  
12th ACM Workshop on Artificial Intelligence and Security, Nov. 2019
- **Fault-Tolerant Routing Algorithm for Mesh based NoC using Reinforcement Learning** (*link*)  
Jagadheesh Samala, **Harshvardhan Takawale**, Yash Chokhani, P Veda Bhanu, J Soumya  
24th International Symposium on VLSI Design and Test (VDATE), July. 2020
- **Talos App: On-Device Machine Learning Using TensorFlow to Detect Android Malware** (*link*)  
**Harshvardhan Takawale** and Abhishek Thakur  
5th International Conference on Internet of Things: Systems, Management & Security, Oct. 2018

## PAST RESEARCH EXPERIENCE

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**Dolby Laboratories, San Francisco**

*Jun 2025 - Aug 2025*

*Ph.D. Research Intern* | Supervisor : **Dr. Phil Brown**

- Modelling Car Cabin Acoustic Frequency Response Fields with Implicit Neural Representation

**Nokia Bell Labs, Cambridge, UK**

*Jun 2024 - Aug 2024*

*Ph.D. Research Intern* | Supervisor : **Dr. Fahim Kawsar**, Dr. Alessandro Montanari

- Detecting Auditory Attention from in-Ear Muscle Contractions using Commodity Earbuds

**Silence Laboratories @ SUTD, Singapore**

*Jul 2020 - Jul 2022*

*Lead Researcher* | Founders : **Prof. Tony Q. S. Quek**, Dr. Jay Prakash, Andrei Bytes

- Co-location based Seamless Authentication for Mobility Services
- Landmark extraction from infrastructure for indoor mobility claim verification
- Real Time Gesture Tracking for Passwordless Login

**Cyber Security Research Centre @ NTU, Singapore**

*Jan 2020 - Jul 2020*

*Research Intern* | Supervisor : **Prof. Thambipillai Srikanthan**, Asst. Prof. Lam Siew Kei

- Side-Channel Assisted Anomaly Detection for Embedded Platforms (Undergraduate Thesis)

**Electrical Engineering & Computer Sciences @ U.C. Berkeley**

*Jun 2019 - Sep 2019*

*Remote Researcher* | Lab PI : **Prof. Dawn Song** | Project head : Dr. Min Du

- Malware Detection on Highly Imbalanced Data through Sequence Modeling

**School of Computer Science @ University of Windsor, Canada**

*May 2019 - Aug 2019*

*Security Research Intern* | Supervisor : **Assoc. Prof. Saeed Samet**

- Integrating Continuous Authentication into the Personal Health Record Applications

## PATENTS

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- **Spatial Acoustic Perception on Miniature Computing Devices.**

Yang Bai, Nakul Garg, Nirupam Roy, Ayushi Mishra, Priyadarshan Narayanasamy,

**Harshvardhan Takawale**

US Patent

- **Auditory Attention Detection From In-Ear Muscle Contractions Using Commodity Earbuds.**

**Harshvardhan Takawale**, Yang Bai, and Alessandro Montanari

US Patent (Technology Disclosure Submitted)

- **Second Factor Authentication for Mobility: Ways to identify friendly frauds**

Jay Prakash, **Harshvardhan Takawale** and Tony Quek

Singapore Patent (Technology Disclosure Submitted)

## AWARDS AND ACHIEVEMENTS

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- Selected for **Financial Aid Award** at ICML 2026.
- Selected for **Dolby University Graduate Researcher Funding**.
- Selected for **Gold Reviewer Award** at ICML 2026.
- Selected for **NSF I-Corps** program as **Entrepreneurial Lead**.
- Selected as a **Principal Investigator** for **Seed Award Program** by Artificial Intelligence Interdisciplinary Institute at Maryland (AIM).
- University of Maryland Graduate School **Dean's Fellowship** for the academic year 2022-23 and 2023-24
- Awarded a fully-funded semester-long internship at Nanyang Technological University to pursue undergraduate thesis
- **Mitacs GRI Scholar** - Selected amongst 700 students in a pool of 200,000 applicants for a fully funded research internship in Canada for the Summer of 2019
- Awarded with **National Talent Search Examination Scholarship** by Indian govt. that is given to 1000 students out of the total 5,000,000+ participants in the entire country.
- Placed first in Urban Livability Challenge 2019 Hackathon by eGovernments Foundation.
- Runner-up at the Megathon-2018 Hackathon
- National Winner of CBSE Heritage India Quiz by Indian govt., with 8000+ participating teams

## TEACHING

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- CMSC436 Programming Handheld Systems, Spring'25  
Instructor: Prof. Michael Marsh
- CMSC422 Introduction to Machine Learning, Spring'23  
Instructor: Prof. Mohammad Nayeem Teli
- CMSC122 Introduction to Computer Programming via the Web, Fall'22  
Instructor: Prof. Pedram Sadeghian

## SERVICES

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- Web Chair, HumanSys 2025
- Publicity and Social Media Chair, HumanSys 2024
- Program Committee, ACM S3 2023
- Artifact Evaluation committee, ACM MobiSys 2023
- Replicability committee, ACM WiSec 2022