

Harish Ram Nambiappan

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Arlington, Texas - 76013, USA

RESEARCH INTERESTS

- **Edge Computing and Internet of Things (IoT)** - Using Edge Computing and IoT to develop multimodal systems and frameworks that can interconnect user smartphone devices with speech and vision based sensors along with robotic LiDAR sensors to perform various human computer interactive tasks and human robot interactive tasks.
- **Machine Learning/Deep Learning** - Develop machine learning/deep learning models for robotic vision tasks such as visual servoing, and assisting disabled people in human computer interactive and human robot interactive scenarios.
- **Robotics** - Develop mobile robot navigation systems using SLAM, 3D Pointcloud data and visual servoing techniques, with a focus on collision avoidance in complex vision-based scenarios.

EDUCATION

- **The University of Texas at Arlington** August 2019 - December 2024
PhD in Computer Science (Advisor: Dr. Fillia Makedon, Dr. Nicholas Gans) Arlington, TX, USA
 - Thesis Dissertation Title: *A Unified Cross-Modal Interactive System for Assisting Vision Impaired in Human Navigation and Indoor based Human Robot Interaction*
- **The University of Texas at Arlington** January 2016 - December 2017
MS in Computer Science Arlington, TX, USA
- **College of Engineering, Guindy - Anna University** August 2010 - December 2014
BE in Computer Science and Engineering Chennai, India

PROFESSIONAL EXPERIENCE

- **The University of Texas at Arlington** January 2024 - December 2024
Graduate Research Assistant (Supervisor: Dr. Nicholas Gans) Arlington, TX
 - Project: Multimodal Interactive System to assist vision impaired in navigation and human robot interaction
- **The University of Texas at Arlington** August 2023 - December 2023
Graduate Teaching Assistant (Supervisor: Dr. Nicholas Gans) Arlington, TX
 - Assisted the supervising professor in Numerical methods course along with conducting and grading exam papers
- **Automation and Intelligent Systems Lab, UT Arlington Research Institute** January 2021 - August 2023
Research Assistant (Supervisor: Dr. Nicholas Gans) Fort Worth, TX
 - Project: Human Robot Interactive System to assist vision impaired people using Speech Recognition and SLAM.
- **Heracleia Human-Centered Computing Lab, The University of Texas at Arlington** August 2020 - December 2020
Graduate Research Assistant (Supervisor: Dr. Fillia Makedon) Arlington, TX
 - Project: Speech sensor interconnection with mobile robot through Internet of Things to perform robotic tasks.
- **Automation and Intelligent Systems Lab, UT Arlington Research Institute** June 2020 - August 2020
Research Assistant (Supervisor: Dr. Nicholas Gans) Fort Worth, TX
 - Project: System to provide medical items through robot navigation, robotic arm manipulation and 3D point clouds
- **The University of Texas at Arlington** August 2019 - May 2020
Graduate Teaching Assistant (Supervisor: Dr. David Kung) Arlington, TX
 - Assisted the professor in Software Design Patterns course along with conducting and grading exam papers

HONORS AND AWARDS

- **Summer 2024 Dissertation Fellowship** June 2024
Awarded during Summer 2024
 - Awarded a stipend of \$8000 by The University of Texas at Arlington Graduate School (Office of Graduate Studies)
- **Best Student Paper Award Runner Up** June 2024
Awarded in ACM PETRA'24 Conference
 - Awarded for the paper "Human-Robot Interactive System for Warehouses using Speech, SLAM and Deep Learning-based Barcode Recognition"
- **Best Paper Award** March 2023
Awarded by MDPI Technologies
 - Awarded by MDPI Technologies Journal for the journal paper "A Survey of Robots in Healthcare"
- **Best PhD Lightning Talk Runner-Up** February 2023
Awarded in UTA Student Computing Research Festival 2023 (SCRF'2023)
 - Awarded for my talk titled "IoT-Based Human Robot Interactive System for Assisting People with Disabilities"

- **Student Travel Grant** June 2022
Awarded during ACM MobiSys'2022
 - Awarded \$1000 during the 20th ACM International Conference on Mobile Systems, Applications, and Services (ACM MobiSys'2022)
- **Best Poster Paper Award** July 2021
Awarded in ACM PETRA'21
 - Awarded in 14th Pervasive Technologies Related to Assistive Environments Conference for the poster paper "MINA: A Multitasking Intelligent Nurse Aid Robot"
- **Best Hardware Hack Sponsored by Digi-Key** February 2021
Awarded by MLH
 - Awarded during the "CUhackit 2021" hackathon
- **Graduate L3/Harris Award for Innovation from L3/Harris** April 2020
Awarded in UTA College of Engineering Innovation Day 2020
 - Awarded in UTA College of Engineering Innovation Day 2020 for our project "HAND-REHA: Dynamic Hand Gesture Recognition for Game-based Wrist Rehabilitation"
- **NSF PETRA Conference Doctoral Consortium Award** June 2018
Awarded during ACM PETRA'18
 - Awarded \$2200 during the 11th Pervasive Technologies Related to Assistive Environments Conference

PUBLICATIONS

Journal Papers

- [1] Enamul Karim, Hamza Reza Pavel, Sama Nikanfar, Aref Hebri, Ayon Roy, **Harish Ram Nambiappan**, Ashish Jaiswal, Glenn R. Wylie, and Fillia Makedon. "Examining the Landscape of Cognitive Fatigue Detection: A Comprehensive Survey". *Technologies* 12, no. 3 (2024): 38. **[Impact Factor: 4.2, CiteScore: 6.7]**
- [2] **Harish Ram Nambiappan**, Stephanie Arevalo Arboleda, Cody Lee Lundberg, Maria Kyrarini, Fillia Makedon, and Nicholas Gans. "MINA: A Robotic Assistant for Hospital Fetching Tasks". *Technologies* 10, no. 2 (2022): 41. **[Impact Factor: 4.2, CiteScore: 6.7]**
- [3] Maria Kyrarini, Fotios Lygerakis, Akilesh Rajavenkatanarayanan, Christos Sevastopoulos, **Harish Ram Nambiappan**, Kodur Krishna Chaitanya, Ashwin Ramesh Babu, Joanne Mathew, and Fillia Makedon. "A Survey of Robots in Healthcare". *Technologies* 9, no. 1 (2021): 8. **[Impact Factor: 4.2, CiteScore: 6.7]**
- [4] Sanika Doolani, Callen Wessels, Varun Kanal, Christos Sevastopoulos, Ashish Jaiswal, **Harish Ram Nambiappan**, and Fillia Makedon. "A Review of Extended Reality (XR) Technologies for Manufacturing Training". *Technologies* 8, no. 4 (2020): 77. **[Impact Factor: 4.2, CiteScore: 6.7]**

Conference Papers

- [1] Sama Nikanfar, Aref Hebri, **Harish Ram Nambiappan**, Gaurav Nale, Mahfuza Siddiqua, Farnaz Farhanipad, and Fillia Makedon. "A Survey on Assistive Technologies for Visually Impaired Individuals: Recent Innovations, Limitations, and Future Directions." In *Proceedings of the 18th ACM International Conference on Pervasive Technologies Related to Assistive Environments (ACM PETRA '25)*, pp. 429-434. 2025.
- [2] **Harish Ram Nambiappan**, Sneha Acharya and Fillia Makedon. "Multimodal Smartphone based IoT Framework for Assisting People with Disabilities in SLAM based Human Robot Interaction". In *Proceedings of the 30th Annual International Conference on Mobile Computing and Networking (ACM MobiCom '24)*, pp. 1680-1682. 2024.
- [3] **Harish Ram Nambiappan**, and Fillia Makedon. "Development and Evaluation of Collision Avoidance User Interface for Assistive Vision Impaired Navigation". In *Adjunct Proceedings of the 37th Annual ACM Symposium on User Interface Software and Technology (ACM UIST '24)*, pp. 1-3. 2024.
- [4] **Harish Ram Nambiappan**, Sama Nikanfar, Ayon Roy, Joey Hussain, Deep Shinglot, Sneha Acharya, Nicholas Gans, and Fillia Makedon. "Human-Robot Interactive System for Warehouses using Speech SLAM and Deep Learning-based Barcode Recognition". In *Proceedings of the 17th International Conference on Pervasive Technologies Related to Assistive Environments (ACM PETRA '24)*, pp. 38-44. 2024.
- [5] Enamul Karim, **Harish Ram Nambiappan**, Sneha Acharya, and Fillia Makedon. "Remote Operated Human Robot Interactive System using Hand Gestures for Persons with Disabilities". In *Proceedings of the 16th International Conference on Pervasive Technologies Related to Assistive Environments (ACM PETRA '23)*, pp. 137-139. 2023.
- [6] **Harish Ram Nambiappan**, Enamul Karim, Md Jillur Rahman Saurav, Anushka Srivastav, Nicholas Gans, and Fillia Makedon. "Smartphone Based IoT-Controller Framework for Assisting the Blind in Human Robot Interaction". In *Proceedings of the 15th International Conference on Pervasive Technologies Related to Assistive Environments (ACM PETRA '22)*, pp. 514-516. 2022.

- [7] **Harish Ram Nambiappan**, Enamul Karim, Jillur Rahman Saurav, Anushka Srivastav, and Fillia Makedon. "Edge-IoT framework for speech and mobile-based human-robot interaction". In *Proceedings of the 20th Annual International Conference on Mobile Systems, Applications and Services (ACM MobiSys '22)*, pp. 527-528. 2022.
- [8] **Harish Ram Nambiappan**, Krishna Chaitanya Kodur, Maria Kyrarini, Fillia Makedon, and Nicholas Gans. "MINA: A Multitasking Intelligent Nurse Aid Robot". In *Proceedings of the 14th Pervasive Technologies Related to Assistive Environments Conference (ACM PETRA '21)*, pp. 266-267. 2021.
- [9] Akilesh Rajavenkatanarayanan, **Harish Ram Nambiappan**, Maria Kyrarini, and Fillia Makedon. "Towards a Real-Time Cognitive Load Assessment System for Industrial Human-Robot Cooperation". *The 29th IEEE International Conference on Robot and Human Interactive Communication (IEEE RO-MAN 2020)*, pp. 698-705. 2020.
- [10] Farnaz Farahanipad, **Harish Ram Nambiappan**, Ashish Jaiswal, Maria Kyrarini, and Fillia Makedon. "HAND-REHA: Dynamic Hand Gesture Recognition for Game-based Wrist Rehabilitation". In *Proceedings of the 13th ACM International Conference on Pervasive Technologies Related to Assistive Environments (ACM PETRA '20)*, pp. 1-9. 2020.
- [11] Varun Kanal, James Brady, **Harish Ram Nambiappan**, Maria Kyrarini, Glenn Wylie, and Fillia Makedon. "Towards a serious game based human-robot framework for fatigue assessment". In *Proceedings of the 13th ACM International Conference on Pervasive Technologies Related to Assistive Environments (ACM PETRA '20)*, pp. 1-6. 2020.
- [12] **Harish Ram Nambiappan** and Sajib Datta. "PISS-IoT: Person Identification and Spotting System in an Internet-of-Things Way". In *Proceedings of the 11th Pervasive Technologies Related to Assistive Environments Conference (ACM PETRA '18)*, pp. 83-90. 2018.

SKILLS

- **Programming Languages:** Java, C, C++, Python, Android Programming
- **Data Science, Machine Learning & Deep Learning:** Pandas, Numpy, Scikit-Learn, PyTorch
- **Networking Protocols & Tools:** TCP/IP Protocol, UDP Protocol, MQTT Protocol, Wireshark
- **Database Systems:** MySQL (SQL), MongoDB (NoSQL), Firebase (NoSQL), MariaDB (SQL)
- **Cloud Technologies:** Amazon AWS S3, Amazon AWS DynamoDB
- **Robotics Tools & Technologies:** ROS (Robot Operating System), Gazebo, RVIZ, MoveIt
- **Other Tools & Technologies:** Android Studio (Smartphone Application Programming), Unity (Mobile AR/VR Applications), Blender (Mobile AR/VR, Gaming Design)