

NUWAN JANAKA

HCI Researcher | Engineer | Research Fellow

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A professional in Human-Computer Interaction (HCI) with extensive experience in both academic research and industrial software development. With a strong engineering background, his multidisciplinary interests include HCI, wearable technology, and the Internet of Things, all aimed at enhancing human capabilities. His current research focuses on wearable intelligent assistants, attention management in heads-up computing, human-AI interaction, and smart glasses applications. In his free time, he enjoys reading, watching anime, and running.

PROFESSIONAL EXPERIENCE

Research Fellow – Smart Systems Institute, NUS

📅 Sep 2023 – Present 📍 Singapore

- Conducting research on integrating the digital and physical worlds to facilitate proactive, intelligent assistance in daily activities under the guidance of Prof. David Hsu.
- Developing *TOM: The Other Me*, a proactive wearable intelligent assistant system.
- Leading the *TOM* development team, consisting of over ten members.

Research Engineer

📅 Oct 2017 – Jul 2018 📍 Sri Lanka

- Led a research study (3 members) on relieving inconveniences caused by mouth whistles for local traffic police and applied for a patent.
- Consulted a garment factory to implement IoT solutions (Industry 4.0) to optimize performance and boost productivity in collaboration with the University of Moratuwa and wrote parts in final report.
- As a co-founder, designed the APIs and front-end for the FootFall application that monitors occupancy (using CCTV cameras) in a specific shop floor area to identify and predict visiting patterns.
- Developed firmware for TyreAid Version 2, tire pressure monitoring system, to support location tracking and verified PCB designs.

Senior Software Engineer – Sysco Labs

📅 Dec 2016 – Sep 2017 📍 Sri Lanka (Colombo)

- Undertook several roles such as a full-stack developer, a release manager, and an analyst to improve the quality of Point of Sales (POS) devices.
- Investigated production issues such as POS device boot-up problems, system crashes, and unresponsive touch display and recommended solutions to reduce them.
- Created proof of concepts to remotely upgrade POS device OS from 32-bit to 64-bit (using Canonical Landscape and image cloning) to remove multiple builds in production to decrease testing times.

Software Engineer – Sysco Labs

📅 May 2015 – Dec 2016 📍 Sri Lanka, USA (San Francisco)

- Integrated chip (EMV) and contactless transaction processing hardware with Cake POS machines and minimized the liability of merchants for fraudulent credit card payments.
- Collaborated with local and foreign developers in integrating new V3 hardware with existing Cake POS systems and enabled brightness control to achieve a romantic ambiance in restaurants.
- Investigated the Idtech MSR failures in production and recommended solutions that reduced replacement costs (5 replacements/month to 1 replacement/month) and improved merchant trust in Cake products.

EDUCATION

Ph.D. in Human-Computer Interaction National University of Singapore (NUS)

📅 Aug 2018 – Jun 2023 📍 Singapore

- Thesis title: Heads-up OHMD notifications
- Advisor: Assoc. Prof. Shengdong Zhao

B.Sc. (Hons.) Eng in Electronic and Telecommunication Engineering

University of Moratuwa (UoM)

📅 Jul 2010 – Apr 2015 📍 Sri Lanka

- GPA: 4.07/4.2, Ranking: 2/100, First class

SELECTED PUBLICATIONS

PilotAR: Streamlining Pilot Studies with OHMDs from Concept to Insight

Nuwan Janaka, Runze Cai, Ashwin Ram, Lin Zhu, Shengdong Zhao, and Kai Qi Yong.

📍 ACM IMWUT 2023 DOI: 10.1145/3678576

TOM: A Development Platform For Wearable Intelligent Assistants

Nuwan Janaka, Shengdong Zhao, David Hsu, Sherisse Tan Jing Wen, and Chun Keat Koh.

📍 UbiComp 2024 DOI: 10.1145/3675094.3678382

PANDALens: Towards AI-Assisted In-Context Writing on OHMD During Travels

Runze Cai, Nuwan Janaka, Yang Chen, Lucia Wang, Shengdong Zhao, and Can Liu.

📍 ACM SIGCHI 2024 DOI: 10.1145/3613904.3642320

GlassMessaging: Towards Ubiquitous Messaging Using OHMDs

Nuwan Janaka, Jie Gao, Lin Zhu, et al.

📍 ACM IMWUT 2023 DOI: 10.1145/3610931

Can Icons Outperform Text? Understanding the Role of Pictograms in OHMD Notifications

Nuwan Janaka, Shengdong Zhao, and Shardul Sapkota.

📍 ACM SIGCHI 2023 DOI: 10.1145/3544548.3580891

Research Intern – Singapore University of Technology and Design, Supervisor: Asst. Prof. Suranga Nanayakkara

📅 Nov 2013 – May 2014

📍 Singapore

- Built a medical device, SHRUG (Stroke Haptic Rehabilitation Utilizing Gaming), to enhance effectiveness of rehabilitation process in collaboration with Singapore St. Andrew's Community Hospital.
- Debugged infrared communication of SparKubes and removed interference with each sensor to explore the interplay between digital and physical space with minimalistic interfaces.
- Contributed to iSwarm, a large-scale underwater lighting project at *iLight Marina Bay 2014*.

PATENTS

Electronic whistle device

Janaka N.P.K.N., Madanayaka T.D., Tharanga W.A.S.

📍 Sri Lankan Patent Application No. LK/P/1/19698. Filing Date: 09 January 2018

Stroke Haptic Rehabilitation Utilizing Gaming

Nanayakkara S.C., Janaka N., Peiris R., Withana A.

📍 Singapore Patent Application No. 10201406827S. Filing Date: 27 October 2014

AWARDS & ACHIEVEMENTS

Dean's Graduate Research Excellence Award

📅 2023

Awarded by the School of Computing at the National University of Singapore

Invited Talk at "ACM Best of CHI" - SIGGRAPH Asia

📅 2022

ACM SIGGRAPH

Gary Marsden Travel Award

📅 2022

Awarded by the ACM SIGCHI Committees for international conference travel

CHI Honorable Mention

📅 2022

Awarded by The ACM CHI Conference on Human Factors in Computing Systems

NUS Research Scholarship

📅 2018

Awarded by Ministry of Education, Singapore

Dean's List in all Academic Semesters

📅 2015

Awarded by University of Moratuwa

Mahapola Higher Education (Merit) Scholarship

📅 2010

Awarded by Mahapola Trust Fund for the excellent performance in GCE A/L examination

Ranked 2nd in Galle District and 32nd in the Island for GCE A/L examination

Among ≈ 210,000 participants

NotiFade: Minimizing OHMD Notification Distractions Using Fading

Nuwan Janaka, Shengdong Zhao, and Samantha Chan.

📍 ACM SIGCHI 2023 DOI: 10.1145/3544549.3585784

ParaGlassMenu: Towards Social-Friendly Subtle Interactions in Conversations

Runze Cai, Nuwan Janaka, Shengdong Zhao, and Minghui Sun.

📍 ACM SIGCHI 2023 DOI: 10.1145/3544548.3581065

Minimizing Attention Costs of Visual OHMD Notifications

Nuwan Janaka.

📍 IEEE ISMAR 2023 DOI: 10.1109/ISMAR-Adjunct6041

AdaptReview: Towards Effective Video Review using Text Summaries and Concept Maps

Shan Zhang, Yang Chen, Nuwan Janaka, Chloe Haigh, Shengdong Zhao, and Wei Tsang Ooi.

📍 INTERACT 2023 DOI: 10.1007/978-3-031-42283-6

Paracentral and near-peripheral visualizations: Towards attention-maintaining secondary information presentation on OHMDs during in-person social interactions [Honorable mention]

Nuwan Janaka, Chloe Haigh, Hyeongcheol Kim, Shan Zhang, and Shengdong Zhao.

📍 ACM SIGCHI 2022 DOI: 10.1145/3491102.3502127

Visual Behaviors and Mobile Information Acquisition

Nuwan Janaka, Xinke Wu, Shan Zhang, Shengdong Zhao, and Petr Slovak.

📍 arXiv 2022 arXiv:2202.02748

EYEditor: Towards On-the-Go Heads-Up Text Editing Using Voice and Manual Input

Debjyoti Ghosh, Pin Sym Foong, Shengdong Zhao, Can Liu, Nuwan Janaka, and Vinitha Erusu.

📍 ACM SIGCHI 2020 DOI: 10.1145/3313831.3376173

SHRUG: stroke haptic rehabilitation using gaming

Roshan Lalintha Peiris, Nuwan Janaka, Deepthika De Silva, and Suranga Nanayakkara.

📍 ACM OZCHI 2014 DOI: 10.1145/2686612.2686669

SparKubes: exploring the interplay between digital and physical spaces with minimalistic interfaces

Santiago Ortega-Avila, Jochen Huber, Nuwan Janaka, Anusha Withana, Piyum Fernando, and Suranga Nanayakkara.

SERVICES

Associate Chair
CHI 2024-2025

- Reviewed and managed full papers as an Associate Chair (AC) for CHI 2024 and CHI 2025.
- Served on the CHI'24 Best Paper Selection Committee.
- Reviewed and managed papers as the AC for CHI-LBW from 2022 to 2024.

Organizing Committee
CHI 2025 2024-2025

- Serving as a Student Volunteer Co-Chair for CHI 2025 in Yokohama, Japan.

Reviewer
CHI, CHI-LBW, IMWUT, UIST, MobileHCI, IUI, VRST, ISMAR 2020-Present

- Reviewed full papers and late-breaking works on notifications, augmented reality, micro-learning, sensing, and smart glasses.

Student Volunteer
ISMAR 2022, IEEE VR 2023, CHI 2023 2022-2023

- Developed the Gather Town (online demonstrations) platform with the Online Experience Team.
- Coordinated physical paper sessions, panel discussions, and workshops, and managed registration duties.

Event Organizer
Singapore Paperthon 2023

- Coordinated with multiple HCI research labs in Singapore, including NUS, SMU, and SUTD, as a main organizer of the event.

Summer Bootcamp 2023

- Played a key role in organizing the inaugural Summer Bootcamp on *Future Interaction for Smart Glasses*, conducting several sessions related to developing applications and prototyping for smart glasses.

Student Mentor
School of Computing Smart Systems Institute, NUS 2021-Present

- Mentoring 6+ interns every three months to enhance their research and development skills related to wearable intelligent assistants.

Teaching Assistant
School of Computing, NUS 2019-2022

- Mentored and conducted tutorials for undergraduate students on HCI and Software Engineering related modules (CS3249: User Interface Design: 20 students/semester * 2 semesters, CS2103T: Software Engineering: 10 students/semester * 4 semesters, CS3219: Software Engineering Principles and Patterns: 40 students/semester * 2 semesters, CS5346: Information Visualization: 60 students/semester * 1 semester)

Lab Instructor
Department of Electronics and Telecommunication Engineering, UoM 2014-2015

- Mentored first-year undergraduates on laboratory practices (100 students/semester * 1 semester).

ACM OZCHI 2014 DOI: 0.1145/2686612.2686643

STRENGTHS

HCI Research

Quantitative and Qualitative Methods
Experimental Design Usability Studies
Statistical Analysis Augmented Reality (AR)
Notifications Heads-up Computing
Human-AI Collaboration Smart glasses

Programming Languages

Python Java C# C C++ Matlab
MySQL

Web Technologies

HTML CSS JS Node.js React
Vue.js

Tools

JASP Atlas.ti R-Studio
Unity3D Android SolidWorks AutoCAD
Altium DXP EagleCAD Keil IDE Arduino
Git Docker Kdenlive Simulink Ubuntu

PROFESSIONAL AFFILIATIONS

- Member of ACM SIGCHI (Association for Computing Machinery) 2017 - Present
- Member of IEEE (Institute of Electrical and Electronics Engineers) 2013 - Present
- Associate member of IESL (Institute of Engineers Sri Lanka) 2013 - Present

LANGUAGES

English (Fluent) Sinhala (Native)

REFEREES

Prof. Shengdong Zhao

@ Synteraction Lab, School of Creative Media and the Department of Computer Science, City University of Hong Kong

shengdong.zhao@cityu.edu.hk

Prof. David Hsu

@ Smart Systems Institute, School of Computing, National University of Singapore

dyhsu@comp.nus.edu.sg

Dr. Pierre Dragicevic

@ Bivwac Team, Inria Bordeaux

pierre.dragicevic@inria.fr