Gyanendra Sharma, Ph.D.

✉ gyanendra.sharma870@gmail.com   in Gyanendra Sharma   ᵍ Scholar   👤 Webpage

5+ years of HCI experience in academia and industry. Currently working as a Senior HMI Researcher at Audi of America, working on design and execution of research projects in the domain of **semi autonomous vehicles and ADAS with the aim of maximizing safety** and usability.

Education

2014 – 2019   🔖 **Ph.D., Rensselaer Polytechnic Institute** Department of Computer Science.
Thesis title: *Spatially Aware Interactions in Large Scale Immersive Environments.*
Research Area: **Human Computer Interaction**, Computer Vision
Advisor: Dr. Richard J. Radke

2009 – 2013   🔖 **Bachelors of Arts, Connecticut College**
Majors: Mathematics and Computer Science
Advisors: Dr. Ozgur Izmirli and Dr. Christopher Hammond

Skills

Languages	🔖	Fluent in English, Nepali and Hindi.
HCI Research	🔖	Human Subject Experimental Design, Human Vehicle Interaction, Statistical Inference, Psychophysical Experiments, Prototyping Hardware Software Systems
Programming Languages	🔖	Python, MATLAB, R, Javascript, C++, C#
AI Tools	🔖	Tensorflow, Keras, generative AI
Others	🔖	RabbitMQ, Websocket, Node.js, AWS, Atlassian tools (Jira, Confluence)

Relevant Experience

2023 – · · · ·   🔖 **Senior HMI Researcher,** Audi of America, ADAS.

- Co-lead the design and execution of **in-vehicle driving studies** exploring the usability and acceptance of hands-free urban driving for level 2+ systems.
- **Presented study results to primary stakeholders (Audi AG, Porsche AG) and management** through presentations, workshops and discussions, that lead to direct influence on product decisions for future ADAS systems.
- **Lead the instrumentation, data collection and analysis efforts** on **eye tracking of study participants using the Smart Eye Pro** system for all in-vehicle studies.

2021 – 2023   🔖 **HMI Researcher,** Toyota Research Institute/Woven Planet, NA.

- Investigated acceptance and mental model of a **continuous steering guidance system with and without visual feedback through HUD** by designing a within-subject AB testing study in a table top simulator.
- Designed and conducted a **psychophysical experiment** to determine the detection threshold of asynchrony between vibration and audio in a **force feedback steering wheel (Sensodrive) for an ADAS based interaction concept**.
- Investigated the perception of **vibration warnings in a force feedback steering wheel as part of an interaction concept** by applying a psychophysics based method called MLDS and showed that the relationship is linear.
- Worked closely with **university collaborators** (Cornell University) and interaction designers to **develop and validate through user studies, mixed reality applications for automated and semi-automated vehicles.**

Relevant Experience (continued)

2019 – 2020   **Postdoctoral Researcher**, Network Science Institute, Northeastern University.

- Studied key metrics for verbal and non-verbal human behavior, focusing on leadership in the context of small group interactions by applying **statistical methods (t-test, regression models, multi-level modeling)**.
- **Conducted a meta-study** to outline the scope and current state of **verbal and non-verbal behavior research** in the context of small group interactions.

2014 – 2019   **Ph.D Student**, Rensselaer Polytechnic Institute.

- Led the instrumentation of an indoor space with camera arrays and implemented a multi-person location and orientation tracking system to **apply it on interaction concepts.**
- Investigated through human subject experiments, **usability and workload of multi-modal interaction inputs**; voice, gestures, user locations and mobile devices to interact with a large physically immersive space.
- **Prototyped and conducted pilot studies** to rapidly iterate over various *user-to-smart room* interaction concepts, using devices ranging from ubiquitous (mobile) to more uncommon ones (Leapmotion) alongside voice, gestures, user location and orientation.
- **Sample Project Link:** https://bit.ly/2ZLNhY9

Research Publications

1   F. Bu, S. Li, G. Sharma, W. Ju, *et al.*, "Extending driving simulation from lab to the road," *Accepted at CHI*, 2024.

2   R. Lange, R. J. Radke, G. Sharma, *et al.*, "Multimodality in group communication research," *Submitted to Journal of Organizational Research Methods*, 2024.

3   G. Sharma, H. Yasuda, and M. Kuehner, "Continuous visual feedback of risk for haptic lateral assistance," *arXiv:2301.10933*, 2023.

4   G. Sharma, H. Yasuda, and M. Kuehner, "Detection threshold of audio haptic asynchrony in a driving context," *arXiv:2307.05451*, 2023.

5   G. Sharma and R. J. Radke, "Multi-person spatial interaction in a large immersive display using smartphones as touchpads," in *Proceedings of the 2020 IntelliSys, Volume 3*, Springer, 2021, pp. 285–302.

6   D. Jivani, G. Sharma, and R. J. Radke, "Occupant location and gesture estimation in large-scale immersive spaces," in *Living Labs Workshop, CHI*, 2018.

7   G. Sharma, D. Jivani, and R. Radke, "Manipulating screen elements in an immersive environment with a wrist-mounted device and free body movement," in *Living Labs Workshop, CHI*, 2018.

8   G. Sharma, J. Braasch, and R. J. Radke, "Interactions in a human-scale immersive environment: The craive-lab," in *Cross-Surface 2016, ACM International Conference on Interactive Surfaces and Spaces*, 2017.

9   Ö. Izmirli and G. Sharma, "Bridging printed music and audio through alignment using a mid-level score representation.," in *ISMIR*, 2012, pp. 61–66.

Patents

2022   H Yasuda, M Kuehner and G Sharma, J Mathews, J Braasch, R J Radke, D Jivani, *Systems and Methods for Enhancing Operator Vigilance*, U.S. Pat. App. No. 18/095,286.

   G Sharma, J Mathews, J Braasch, R J Radke, D Jivani, *Multi-Sensor Systems and Methods for Providing Immersive Virtual Environments*, PCT/US2022/051474.

2017   G Sharma, M Nawhal, A Prakash, P Kumar, M Jain, A Singhee and A Shah, *Hybrid Virtual and Physical Jewelry Shopping Experience*, US 2018/0357702 A1.