SNEHASHISH DE

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Research Profile

Human-computer interaction researcher working across embodied interactions, immersive systems, human-AI interaction, and interactive prototyping. My research combines mixed-methods inquiry and technical experimentation to understand how emerging technologies shape human behavior, creativity, and learning.

Research interests human-computer interaction; embodied interactions; human-AI interaction; virtual and extended reality; immersive learning; interactive systems; creativity support tools

Education

May 2025 **Indiana University Bloomington**, Bloomington, IN
M.S., Human-Computer Interaction and Design (HCI/d), Luddy School of Informatics, Computing, and Engineering. GPA 3.95/4.00
Thesis: *Controlling Anime Watching Addiction Through Mindful Watching and Social Connection*. Advisor: Michael Stallings

May 2023 **University of Mumbai**, Mumbai, India
B.E., Information Technology, Thadomal Shahani College of Engineering. GPA 8.64/10.00

Research Experience

Jun 2025–present **Lead Research Assistant**, Intelligent Perceptual Design (IPD) Lab, Eskenazi School of Art, Architecture + Design, Indiana University Bloomington. Supervisor: Hoa Vo

- Lead mixed-methods HCI research with 250+ participants in VR, including EEG data collection, usability studies, contextual inquiry, think-aloud studies, and surveys on human behavior and experience in immersive environments.
- Established a new research and analysis workflow, redesigning AI-enabled processes with research, engineering, architecture, and data teams and cutting manual analysis effort by more than 90%.
- Analyze behavioral, qualitative, and quantitative data (ANOVA, paired-samples t-tests); report findings through research reports, stakeholder presentations, and design recommendations.
- Supervised 4 researchers and data scientists and helped secure approximately $58K in research funding through prototypes, preliminary data, and technical materials.

May 2024–May 2025 **Research Assistant**, Intelligent Perceptual Design (IPD) Lab, Eskenazi School of Art, Architecture + Design, Indiana University Bloomington. Supervisor: Hoa Vo

- Interviewed architecture professionals about creative workflows, unmet needs, and perceptions of AI-assisted design.
- Turned findings into experimental concepts and interactive prototypes, then compared traditional and AI-assisted workflows through usability studies to see how each shapes designers' creative process and outcomes.
- Collaborated across HCI, architecture, and data science on generative AI for spatial design, developing and evaluating approaches that generate museum layouts while supporting architects' creative exploration and decisions.

Jan–Apr 2025 **Research Assistant**, Community Computer-Interaction (C-CI) Lab, Luddy School of Informatics, Indiana University Bloomington. Supervisor: Austin Toombs

- Conducted a literature review and designed a survey study on parasocial relationships and fictosexuality involving anime characters, examining how attachment, identity, and mediated interaction shape relationships with fictional characters.

Selected HCI & Interactive Systems Projects

Research Projects

Mapping Indoor Travel Patterns with Virtual Reality and Vision Transformer (2024–present; team of six; funded by Amazon Research Awards, 2025; Grant-in-Aid of Research & Creative Activity, 2024; Faculty Assistance in Data Science, 2025; IUPAH Fellowship, 2025)

PI: Hoa Vo. ***My role:*** *led mixed-methods research sessions in VR using the think-aloud protocol and survey data; collected EEG data in the follow-up studio sessions; supervised a team of 4 researchers and data scientists; analyzed qualitative and quantitative findings; co-authored the paper and contributed to manuscript preparation and editing.*

The eCAADe paper reports two IRB-approved studies, a 102-participant pilot in a virtual office and a 65-participant follow-up in a virtual art studio, that fine-tuned a Vision Transformer on egocentric VR recordings to classify where people move in a building. Findings showed that spatial adjacency did not guarantee usability, and that pausing at a doorway predicted whether people entered a room. The art-studio study is ongoing and has grown to 155 participants, adding EEG data collection that the paper does not include.

Artificial Intelligence and Virtual Reality in Students' Design Process (2024–2026; funded by Mack Fellowship Grant)

PI: Hoa Vo. ***My role:*** *conducted the research study with 32 designers; interviewed architecture professionals; collected and analyzed the qualitative and quantitative survey data and built visualizations to interpret the results.*

Compared two design workflows with 32 designers (16 per workflow): a traditional workflow of hand-drawn paper sketching followed by Revit modeling, and a rule-based symbolic AI and VR workflow in which AI took the place of paper sketching and VR took the place of Revit. The study evaluated participants' technology experience, acceptance, and creativity of the outcomes. Participants and judges completed surveys; two judges rated the creativity of the designs and were then interviewed about the outcomes.

Design and Immersive Experiences

Kanji Learning Experience (individual project, Jul 2026–present)

Interviews and usability testing with Japanese learners and speakers showed that people memorize kanji more easily when a character is tied to a memory of seeing or using it, and the embodied interaction of writing by hand. I designed a narrative game around these findings: the player is a kanji god who finds kanji, and each kanji pictogram comes to life as the player draws it.

Pokémon Soul-Switch (course project, Introduction to Virtual Reality, INFO-I 590; Oct 2024–Jan 2025)

Designed and developed an embodied VR experience in Unity where players switch perspectives with Pokémon and use body-based movement, abilities, and communication to explore perspective-taking and empathy. Integrated Convai-powered characters for dynamic player-Pokémon interaction and iteratively play-tested the experience to refine embodied and narrative mechanics.

Embodied Shopping Experience (course project, Introduction to HCI and Design, INFO-I 541; team of four; Sep–Nov 2023)

Conducted grocery-store field observations to understand shopping behaviors and dietary challenges, then translated findings into a smartwatch experience supporting personalized food decisions. Designed haptic feedback interactions triggered during product selection to support in-the-moment decision-making.

Publications

† corresponding author, ‡ graduate student author

Conference Paper

†Vo, H., ‡**De, S.**, ‡Munnolli, A., ‡Pagadala, D., ‡Dunna, K., & ‡Rane, H. (2026, September 9–11). Mapping indoor travel patterns with virtual reality and vision transformer. In *Informed Creativity and Fabrication in Architecture and Engineering: Proceedings of the 44th Annual Conference of the Association of Education and Research in Computer Aided Architectural Design in Europe (eCAADe 2026)* (Vol. 2). Technische Hochschule Lübeck, Lübeck, Germany. https://papers.cumincad.org/cgi-bin/works/paper/ecaade2026_343

Journal Manuscripts in Preparation

†Vo, H., & ‡**De, S.** (in preparation). Symbolic artificial intelligence and virtual reality in spatial creativity: A comparative study. *International Journal of Artificial Intelligence in Education*.

†Vo, H., ‡**De, S.**, ‡Munnolli, A., ‡Pagadala, D., ‡Dunna, K., & ‡Rane, H. (with editor). VR-ViT: Vision Transformer-based floor-plan analytics from egocentric virtual reality recordings for pre-construction building design evaluation. *Automation in Construction*.

Presentations and Invited Talks

Invited Talks

Nov 2026	Vo, H., & **De, S.** (2026, November). Engaging yet Illogical? A Curious Case of Symbolic AI and Immersive VR in Design Thinking. Center of Excellence for Women & Technology, XR Alliance Team, Indiana University; co-present work on XR and AI as tools for creativity in immersive environments.
Nov 2025	Vo, H., & **De, S.** (2025, November). Designing with Extended Reality (XR): Adaptive Technologies & Creativity in the Built Environment. Center of Excellence for Women & Technology, XR Alliance Team, Indiana University; co-presented work on XR, adaptive technologies, and research automation in immersive environments.

Conference and Fellowship Presentations

Sep 2026	Vo, H., **De, S.**, Munnolli, A., Pagadala, D., Dunna, K., & Rane, H. (2026, September 9–11). *Mapping Indoor Travel Patterns with Virtual Reality and Vision Transformer.* 44th Annual eCAADe Conference, Lübeck, Germany.
May 2026	Vo, H., & **De, S.** (2026, May 29). *Artificial Intelligence and Virtual Reality in Students' Design Process* (Mack Fellowship Presentation). 38th Annual Faculty Academy on Excellence in Teaching (FACET) Retreat, Indiana University, Indianapolis.
Mar 2026	Vo, H., **De, S.**, Pagadala, D., Dunna, K., & Rane, H. (2026, March 16–19). *Vision Transformer for Navigation Patterns: A Heatmap Analysis.* Interior Design Educators Council (IDEC) Annual Conference, Chicago, IL.

Awards

Mar 2026	1st Place, Best Presentation in Category: Scholarship of Design and Research, Interior Design Educators Council (IDEC)

Teaching and Mentoring Experience

Oct–Dec 2025	**Research Mentor**, Eskenazi School of Art, Architecture + Design, Indiana University Bloomington. Mentored two undergraduate scholars in the Emerging Scholars Research Experience (Center of Excellence for Women & Technology), guiding research development and giving feedback.
Jan 2024–May 2025	**Teaching Assistant, Interaction Design Methods** (INFO-I 543), Luddy School of Informatics, Computing, and Engineering. Supported 30 graduate students in core HCI research methods; gave feedback on study design, qualitative inquiry, synthesis, presentation of findings, and research documentation. Instructor: Austin Toombs.
Aug–Dec 2024	**Teaching Assistant, Studio Practice** (INFO-I 590), Luddy School of Informatics, Computing, and Engineering. Supported 80 graduate students working on industry-sponsored projects through peer reviews and feedback on project documentation, research deliverables, and presentations. Instructor: Austin Toombs.

Additional Research, Technical, and Industry Experience

May–Dec 2025	**Interactive Technology Assistant**, The Media School, Indiana University. Contributed to a Unity-based interactive educational application for stroke survivors with aphasia.
May–Dec 2025	**Data Visualization Assistant**, College of Arts & Sciences, Indiana University. Designed interactive visualizations of geographic and collaborative networks among opera artists across the United States.
Nov–Dec 2024	**UX Researcher and Designer**, Lepal AI (volunteer). 30 cross-cultural interviews and iterative prototype testing (mobile and smartwatch); design changes improved a mental health AI's context awareness by 33%.
Aug–Dec 2024	**UX Researcher**, Microsoft (industry-sponsored project). Accessibility research with color-blind users on financial-data experiences in Excel (interviews, usability tests, A/B testing); produced 4 accessible concept designs across 5 sprints.
Jan–May 2024	**UX Researcher**, Salesforce (industry-sponsored project). Interviews, Wizard-of-Oz testing, and usability testing; 5 usability tests synthesized into 3 features for Slack AI, contributing to a 40% increase in measured trust score.

Aug 2022–Mar 2023	**Graphic Designer**, University of Mumbai (volunteer). Led a three-person team on 20+ digital media, poster, magazine, and event projects.
Jun–Jul 2021	**Web Developer Intern**, Exposys Data Labs. Built a WebRTC and Django video platform prototype for synchronous user-to-user interaction.
Jun–Aug 2020	**IoT Intern**, Enovate Skill. Designed and simulated IoT systems in Autodesk Tinkercad, and built an environmental fire detection and alert system using an Arduino and Bluetooth module.

Certifications and Training

Jul 2026	**AI Fluency: Framework & Foundations**, Anthropic (certificate of completion)
Feb 2025	**CITI Training,** Human Research Social/Behavioral Researchers (certificate of completion)

Skills and Languages

Qualitative research	user interviews; contextual inquiry; field studies; focus groups; co-design; diary studies; cross-cultural research; qualitative data analysis; personas; journey mapping; participant recruitment; affinity mapping
Evaluative research	lab and remote usability testing; EEG data collection; think-aloud studies; concept testing; Wizard-of-Oz testing; iterative prototype testing; A/B testing; behavioral studies
Quantitative	survey design; behavioral analysis; statistical analysis; UX metrics; data cleaning; data visualization
Immersive tech and code	virtual and extended reality; Unity; Unreal Engine; Three.js; interactive prototyping; game design; narrative design; Python; JavaScript; C#
Tools	NVivo; Qualtrics; Figma; Adobe Creative Cloud; Microsoft Office; Canvas; Google Workspace; Revit
Languages	English (native); Hindi (conversational); Bengali (conversational); Japanese (conversational); Chinese (learning)