

**STATEMENT** — I specialize in integrating AI, UX, and 3D interaction design to develop adaptive, context-aware XR systems. My work combines machine learning, AI, and UX evaluation methods to uncover user needs and interpret both social and physical contexts. I design and implement 3D interfaces that adapt to these contexts to support productivity, situational awareness, accessibility, social presence, and interaction with avatars, intelligent agents, and other people. Through mixed-methods research, I evaluate these systems and develop frameworks and guidelines for user-centered and intelligent interfaces.

ACADEMIC POSITIONS & EDUCATION

<b>Postdoctoral Researcher</b> (2025-Present)	<u>SAIL</u> : Symbiotic and Augmented Intelligence Lab	<b>Georgia Tech, USA</b>
<b>Ph.D. in Computer Science</b> (Received: 2024)	<u>Specialization</u> : Human-Computer Interaction	<b>Virginia Tech, USA</b>
<b>M.Sc. in Computer Science</b> (Received: 2020)	<u>Specialization</u> : Human-Computer Interaction	<b>Virginia Tech, USA</b>
<b>M.Sc. in Computer Science</b>	<u>Specialization</u> : Computational Perception and Robotics	<b>Georgia Tech, USA</b>
<b>B.Sc. in Computer Engineering</b> (Received: 2014)	<u>Major</u> : Computer Hardware	<b>Beheshti University, Iran</b>

INDUSTRY EXPERIENCE

<b>Adobe Research</b>	<b>Position: Research Scientist Intern</b>	<b>Summer 2021</b>
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Context-Aware AR for Document Navigation:

- Developed 16 iOS interfaces for AR document navigation and evaluated their performance across various contexts.
- Leveraged survey results from 12 users and applied the design cycle to identify design principles for different contexts.

Skills & Tools: Apple ARKit, Swift, Adobe Aero, 3D Interface/Interaction(3DI) design, UX design

<b>Microsoft Research(MSR)</b>	<b>Position: Research Intern</b>	<b>Summer 2020</b>
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Exploring the Benefits of Virtual Monitors for the Low-vision Population:

- Designed a VR tool to explore the potential benefits of virtual monitors for low-vision users and evaluated its effectiveness through a user study with 21 low-vision participants.
- Derived key design guidelines to improve hardware and software features of virtual monitors [6].

Skills & Tools: Assistive technology development, 3DI & US design, Unity Game Engine, C#, Mixed-methods research

RESEARCH EXPERIENCE AND PROJECTS

<b>Virginia Tech</b>	<b>Supervised by: Doug. A. Bowman</b>	<b>2018-2024</b>
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*Ph.D. Dissertation: Intelligent Augmented Reality (iAR)*

Dissertation Title: Intelligent Augmented Reality (iAR): Context-aware Inference and Adaptation in AR [4]

*Developed Comprehensive Design Guidelines and Frameworks for XR & iAR Interface*

- XR Design Space: Identified design dimensions for XR interfaces [5].
- Taxonomy of Context: Established a taxonomy of quantifiable contextual components impacting AR efficacy [3].
- Architecture for iAR: Developed an iAR architecture to infer implicit context from quantifiable data and enable automatic adaptation of the AR interface [3].
- Evaluation of AR Input Modalities: Formulated a framework to assess AR input modality effectiveness and conducted an in-depth evaluation of Eye input [2].
- AR Interface Classification: Proposed a classification methodology for AR interfaces and introduced the concept of “Glanceable AR” [9], [10].

*Designed and Prototyped Context-Aware AR Interfaces*

*Designed and Conducted User Experience Evaluations of Behavioral, Qualitative, & Quantitative Data*

- User-Specified Adaptation in Various Contexts: Designed an AR experiment to gather quantitative and qualitative data on user behavior and manual AR adaptations in a context-switching scenario. Analyzed patterns to understand the relationship between context and user adaptations, extracting design guidelines for AR interfaces [3].
- Adaptive XR Placement Strategy for Social Interactions with Virtual Avatars: Leveraging real-world physical objects, avatar positioning and persona, and avatar-user interactions, designed and implemented an adaptive spatial placement approach for XR content on HoloLens devices. Conducted a user study across diverse social settings and mobility contexts, resulting in design guidelines for effective placement strategies in dynamic environments [5].
- Intelligent AR for Social Contexts: Developed a socially intelligent AR interface that leverages computer vision and speech recognition to tailor content based on social context. Conducted a user study demonstrating its enhanced efficiency and increased social awareness [7]
- Occlusion Management in AR: Designed and evaluated various AR techniques to manage real-world occlusion and enhance user interaction with virtual avatars and situational awareness. Conducted user studies to assess their impact on user experience, awareness, and access to AR information [8], [10].

**Other Team Projects and Collaborations**We introduced and developed various 3D interactions and interfaces to enhance VR collaboration, effectiveness, user engagement, and presence [1].

**Skills & Tools:**

C#, Swift, Python, AR/VR development, Unity 3D, MRTK, ARKit, ARCore, Adobe Aero, Photon Networking, Computer Vision, OpenCV, Flask Web App Dev, 3DI & UX design, Mixed-methods research, Quantitative and qualitative statistical analysis, JMP/SPSS/R, Systematic Review and Analysis, Research Management Tools, Critical Thinking, Brainstorming, Teamwork, LaTeX, Academic writing

**Stanford University**

**Supervised by: Dorsa Sadigh**

**2017-2018**

**Leveraging Effects of Human Actions on Autonomous Cars Planning:** Designed and developed driving simulation scenarios to gather driver data across diverse situations.

**Skills & Tools:**

SimVista, SimCreator

**University of Toronto**

**Supervised by: Brenda McCabe & Frank Rudzicz**

**2015-2016**

**CARE-RATE: An online Assistive Technology Rating System for Caregivers**

Automated web crawling and data extraction to compile accurate, reliable information from target websites for Ludwig, a conversational robot to support Alzheimer's caregivers.

**Skills & Tools:**

Selenium, Apache Nutch

**InPRO: Automated Indoor Construction Progress Monitoring**

Researched and implemented machine learning, swarm intelligence, classification, and computer vision algorithms for automating UAV flight paths in dynamic construction environments to capture images [12], , recognize construction progress states, and automatically update the 4D Building Information Model (BIM) [11].

**Skills & Tools:**

Python2, OpenCV, Pymunk

## SELECTED PROFESSIONAL ENGAGEMENTS

**Invited Talk**

— Intelligent Augmented Reality (iAR)	<u>Building Construction Ph.D. Seminar, Georgia Tech</u>	Mar. 2025
— Towards iAR: Designing Effective AR through Context-Awareness	<u>Center for Responsible AI, Coburg University</u>	2024
— Context-Aware Inference and Adaptation in iAR	<u>PERCxr at IEEE ISMAR<sup>1</sup></u>	2022

**Co-Organizer**

— Special Session: To Automate or To Augment? Advancing Cognitive & Physical Abilities in Industrial Workplaces	<u>IEEE CASE<sup>2</sup></u>	2025
— The 1st Workshop on intelligent XR (iXR): Harnessing AI for Next-Generation XR User Experiences	<u>IEEE ISMAR</u>	2024

**International Program Committee(IPC)**

	<u>IEEE ISMAR</u>	2025
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**Conference Committee Member— Poster Session**

	<u>IEEE VR<sup>3</sup></u>	2025
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**Conference Chair— Poster Session**

	<u>ACM Spatial User Interaction (SUI)</u>	2024
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**Winning Team— Best 3DUI Award**

	<u>IEEE VR</u>	2021 & 2022
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**Service Award— Department of Computer Science**

	<u>Virginia Tech</u>	2020
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**Mentoring**

	<u>Akhil Ajikumar, Parisa Ghasemi, Alexander Giovannelli, Steven Yoo, Daniel Stover</u>	2020-present
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**Peer Reviewer**

	<u>IEEE VR &amp; ISMAR &amp; TVCG<sup>4</sup>, ACM CHI &amp; UIST &amp; AutomotiveUI</u>	2020-present
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**Leadership**

	<u>CS Graduate Student Council &amp; Iranian Society Virginia Tech</u>	2018-2021
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## SELECTED PUBLICATIONS

- [1] A. Giovannelli, L. Pavanatto, **S. Davari**, et al., "Investigating the Influence of Playback Interactivity during Guided Tours for Asynchronous Collaboration in Virtual Reality," 2025.
- [2] **S. Davari** and D. A. Bowman, "Evaluating input modalities in ar: A framework and a survey on eye input," [In Preparation], 2025.
- [3] **S. Davari** et al., "Towards Intelligent AR (iAR): A Taxonomy of Context, An iAR Architecture, and an Empirical Study," *IEEE TVCG[Under Review]*, 2024.
- [4] **S. Davari**, "Intelligent Augmented Reality (iAR): Context-aware Inference and Adaptation in AR," Ph.D. dissertation, Virginia Tech, 2024.
- [5] **S. Davari** and D. A. Bowman, "Towards Context-Aware Adaptation in XR: A Design Space for XR Interfaces and an Adaptive Placement Strategy," *IEEE TVCG[Under Review]*, 2024.
- [6] L. Pavanatto, **S. Davari**, et al., "Virtual monitors vs. physical monitors: an empirical comparison for productivity work," *Frontiers in VR*, vol. 4, 2023.
- [7] **S. Davari** et al., "Validating the Benefits of Glanceable and Context-Aware Augmented Reality for Everyday Information Access Tasks," in *IEEE VR*, 2022, pp. 336–444.
- [8] F. Lu, **S. Davari**, and D. Bowman, "Exploration of Techniques for Rapid Activation of Glanceable Information in Head-Worn AR," in *ACM SUI*, 2021.
- [9] F. Lu, **S. Davari**, et al., "Glanceable AR: Evaluating Information Access Methods for Head-Worn AR," in *IEEE VR*, Mar. 2020, pp. 930–939.
- [10] **S. Davari** et al., "Occlusion Management Techniques for Everyday Glanceable AR Interfaces," in *IEEE VR Workshops (VRW)*, 2020, pp. 324–330.
- [11] H. Hamledari, **S. Davari**, et al., "Uav-enabled site-to-bim automation: aerial robotic- and computer vision-based development of as-built/as-is bims and quality control," *Construction Research Congress 2018*, pp. 336–346, 2018.
- [12] H. Hamledari, **S. Davari**, et al., "Uav mission planning using swarm intelligence and 4d bims in support of vision-based construction progress monitoring and as-built modeling," *Construction Research Congress 2018*, pp. 43–53, 2018. DOI: <https://doi.org/10.1061/9780784481264.005>.

<sup>1</sup>Workshop on Perceptual and Cognitive Issues in xR(PERCxr) at IEEE International Symposium on Mixed and Augmented Reality (ISMAR)

<sup>2</sup>IEEE International Conference on Automation Science and Engineering (CASE)

<sup>3</sup>IEEE Conference on Virtual Reality and 3D User Interfaces (IEEE VR)

<sup>4</sup>Transactions on Visualization and Computer Graphics (TVCG)