

YOONSANG KIM

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RESEARCH INTERESTS

My research explores how everyday context is encoded into digital representations to support human-to-human and human-to-AI communication in XR. I investigate novel interaction and visualization paradigms leveraging implicit and explicit multimodal cues (spatiotemporal, verbal, auditory) for context-aware reasoning and privacy-preserving assistance in real-world XR environments.

Keywords: AR | MR | XR | Personal Context-aware | Human-centered AI | Ubiquitous Computing | User Interface | User Privacy

EDUCATION

Stony Brook University <i>Ph.D. Candidate., Computer Science</i> <i>Advisor: Arie E. Kaufman</i>	Stony Brook, NY, USA Aug. 2020 – Present
Stony Brook University <i>M.S., Computer Science</i> <i>Advisor: Xiaojun Bi, Arie E. Kaufman</i>	Stony Brook, NY, USA Aug. 2018 – May. 2020
Darmstadt University of Applied Sciences <i>Exchange Student in B.S., Computer Science</i> <i>(via Soongsil University Program)</i>	Darmstadt, Germany Mar. 2015 – Jul. 2015
Soongsil University <i>B.S., Computer Science and Engineering</i>	Seoul, Korea Mar. 2010 – Feb. 2017

RESEARCH EXPERIENCE & BACKGROUND

Stony Brook University <i>Research Assistant</i>	Stony Brook, NY, USA May. 2022 – Present
<ul style="list-style-type: none"> Designed object-centric spatial graphs (scene graph) to disambiguate referents with LLM agents Researched mapping of embodied interactions (speech and gesture) to spatial representations in AR Designed socially unobtrusive conversational AI assistant for glassed-form factor wearable XR Designed personalized ubiquitous, spatial prior-aware XR system with multimodal LLM Prototyped interactive recommender system using RAG LLM for personalized AR experience Conducted research on personal context-aware system for cross-virtuality (cross-device, remote) Researched conversational, cross-reality (AR-to-VR) interface for remote collaboration Investigated spatial computing (PC-2D vs MR) for network security apps with Apple Vision Pro Conducted controlled and “in-the-wild” (N=150+) evaluations deriving patterns across subjects Designed end-to-end analytics framework for user behaviors in XR environments (AR, VR, MR) using multimodal (visual, audio, interaction) cues Implemented hand-held system (tablet, mobile) for collaborative multi-user AR experience Developed a novel design of OS-level access control system in AR for privacy-protection Explored local & remote rendering of mapping gigapixel/high dimensional data to Tiled displays 	
<i>Graduate Student Researcher</i>	Stony Brook, NY, USA – May. 2020
<ul style="list-style-type: none"> Studied platform/device-agnosticism for scientific (volume rendering) /information visualization Explored the applications of gesture-based input in Virtual Reality using Leap motion Designed Shark² algorithm (shape/location channel) for Unity C# to utilize across multi-platforms 	
Soongsil University <i>Undergraduate Student Researcher</i>	Seoul, Korea – Jul. 2018
<ul style="list-style-type: none"> Developed hand gesture recognizer for MR remote desktop settings Developed an immersive remote desktop screen network streaming system in C and Unity C# utilizing virtualized graphics card and WINAPI hooking 	

PUBLICATIONS

Peer-Reviewed Conference Papers

- C6. **Yoonsang Kim**, Devshree Jadeja, Divyansh Pradhan, Yalong Yang, Arie Kaufman.
[SpeechLess: Micro-utterance with Personalized Spatial Memory-aware Assistant in Everyday Augmented Reality.](#)
In *Proceedings of the IEEE Conference on Virtual Reality and 3D User Interfaces*. (**IEEE VR 2026**)
- C5. **Yoonsang Kim**, Divyansh Pradhan, Devshree Jadeja, Arie Kaufman.
[From Speech-to-Spatial: Grounding Utterances on Live Shared View with Augmented Reality.](#)
In *Proceedings of the IEEE Conference on Virtual Reality and 3D User Interfaces*. (**IEEE VR 2026**)

- C4. Matthew Castellana, Chahat Kalsi, **Yoonsang Kim**, Saeed Boorboor, Arie Kaufman.
[AuxiScope: Handheld Augmented Reality Tablet as an Auxiliary Display for Large-Scale Display Systems.](#)
In *Proceedings of the IEEE International Symposium on Mixed and Augmented Reality.* (**IEEE ISMAR 2025**)
- C3. **Yoonsang Kim**, Sanket Goutham, Amir Rahmati, Arie Kaufman.
[Erebus: Access Control for Augmented Reality Systems.](#)
In *Proceedings of the USENIX Conference on Security Symposium.* (**USENIX Security 2023**)
- C2. Yu-Jung Ko, Hang Zhao, **Yoonsang Kim**, IV Ramakrishnan, Shumin Zhai, Xiaojun Bi. **Honorable Mention Award 🏆**
[Modeling Two-Dimensional Touch Pointing.](#)
In *Proceedings of the ACM Symposium on User Interface Software and Technology.* (**ACM UIST 2020**)
- C1. Suwen Zhu, **Yoonsang Kim**, Jingjie Zheng, Jennifer Yi Luo, Liuping Wang, Xiangmin Fan, Feng Tian, Xiaojun Bi.
[Using Bayes' Theorem for Command Input: Principle, Models, and Applications.](#)
In *Proceedings of the ACM Conference on Human Factors in Computing Systems.* (**ACM CHI 2020**)

Peer-Reviewed Journal Articles

- J4. **Yoonsang Kim**, Zainab Aamir, Mithilesh Singh, Saeed Boorboor, Klaus Mueller, Arie Kaufman.
[Explainable XR: Understanding User Behaviors of XR Environments using LLM-assisted Analytics Framework.](#)
IEEE Transactions on Visualization and Computer Graphics. (**IEEE TVCG 2025**)
- J3. Saeed Boorboor, **Yoonsang Kim**, Ping Hu, Josef M Moses, Brian A Colle, Arie Kaufman.
[Submerge: Visualizing Storm Surge Flooding Simulations in Immersive Display Ecologies.](#)
IEEE Transactions on Visualization and Computer Graphics. (**IEEE TVCG 2023**)
- J2. Saeed Boorboor, Matthew Castellana, **Yoonsang Kim**, Zhutian Chen, Johanna Beyer, Hanspeter Pfister, Arie Kaufman.
[VoxAR: Adaptive Visualization of Volume Rendered Objects in Optical See-Through Augmented Reality.](#)
IEEE Transactions on Visualization and Computer Graphics. (**IEEE TVCG 2023**)
- J1. **Yoonsang Kim**, Geunyeop Ha, Sangjun Lee.
[Flexible Remote-Control Application for Virtual Reality using Virtual Graphics Driver and OpenCV.](#)
International Journal of Applied Engineering Research. (**IJAER 2017**)

Peer-Reviewed Workshop & Posters

- W4. **Yoonsang Kim**, Yalong Yang, Arie Kaufman.
[Memento: Towards Proactive Visualization of Everyday Memories with Personal Wearable AR Assistant.](#)
In *Proceedings of the IEEE Conference on Virtual Reality and 3D User Interfaces Abstracts and Workshops.* (**IEEE VRW 2026**)
- W3. **Yoonsang Kim**, Swapnil Dey, Arie Kaufman.
[Evaluating Spatialized Auditory Cues for Rapid Attention Capture in XR.](#) **Honorable Mention Award @ XRIOS Workshop 🏆**
In *Proceedings of the IEEE Conference on Virtual Reality and 3D User Interfaces Abstracts and Workshops.* (**IEEE VRW 2026**)
- W2. **Yoonsang Kim**, Saeed Boorboor, Amir Rahmati, Arie Kaufman.
[Design of Privacy Preservation System in Augmented Reality.](#)
IEEE Symposium on Visualization for Cyber Security. (**IEEE VizSec 2021**)
- W1. Geunyeop Ha, **Yoonsang Kim**, Dongyeon Lee, Sangjun Lee.
[Design and Implementation of Remote-Control Application in Virtual Reality Environment using Virtual Graphic Driver and OpenCV.](#)
Korean Institute of Information Scientists and Engineers. (**KIISE 2016**)

SERVICES

Reviewer

IEEE International Symposium on Mixed and Augmented Reality (ISMAR)	2025
IEEE Conference on Virtual Reality and 3D User Interfaces (VR)	2025
IEEE Pacific Visualization Conference (PacificVis)	2025
ACM Conference on Human Factors in Computing Systems (CHI)	2025
ACM Symposium on User Interface Software and Technology (UIST)	2025
ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT)	2025
ACM Symposium on Virtual Reality Software and Technology (VRST)	2025
ACM Symposium on Spatial User Interaction (SUI)	2025
ACM Designing Interactive Systems (DIS)	2026
ACM Interactive Surfaces and Spaces (ISS)	2025, 2026

Leadership

Mentoring Graduate Students for Independent Study Research @ Stony Brook University	2020
Supervised and collaborated with 4 undergraduates and 17 graduate students on: Wearable/Hand-held AR, Multi-sensory Perception, Context-aware Interface, AR Security, Cross-reality Collaboration, SLAM.	- Present
Graduate Mentor of K-12 Energy Tech @ Center of Excellence in Wireless and Information Technology	2024
Engaged with over 1,400 New York state high school students introducing immersive technologies.	- 2025
KidOYO Summer Mentoring Program @ Stony Brook University	2022
Mentored 2 high school students on designing a remote visualization tool with hand-held AR and tiled display.	
Exchange Student Program Mentor @ Soongsil University	2016
Assisted incoming students of exchange student program to settle into local community and academic life.	

HONORS & AWARDS

Honorable Mention Award. XRIOS Workshop @ IEEE VR 2026	2026
Recognized for Outstanding Review @ IEEE ISMAR 2025	2025
Honorable Mention Award @ ACM UIST 2020	2020
Best Data Science/AI Award. SBU Hackathon @ Stony Brook University	2019
Dean's Award. Software Competition @ Soongsil University	2016
National Semi-Finalist. Microsoft Imagine Cup @ Microsoft Korea	2016
Gold Award. IT·BT Software Convergence Engineering Competition @ Soongsil University	2015

MEDIA & EXPOSURE

Weathering the Storm: How SBU's Climate Research Is Shaping Long Island's Future @ Stony Brook University News	2025
Naval Science and Technology: Growing Energy Resiliency Through Research @ Future Force Magazine (Vol. 9, No. 1)	2023
Reality Deck Helps Researchers Visualize and Predict Storm Surge Emergencies @ Stony Brook University News	2022

TEACHING EXPERIENCE

Instructor (CSE566: Virtual Reality) @ Stony Brook University	2026
	2020
Graduate Course Teaching Assistant (CSE566: Virtual Reality) @ Stony Brook University	- 2023
Graduate Course Teaching Assistant (CSE564: Visualization) @ Stony Brook University	2021
Graduate Course Teaching Assistant (CSE518: Human Computer Interaction) @ Stony Brook University	2021
Undergraduate Teaching Assistant (CSE320: Systems Fundamental II – Operating System) @ Stony Brook University	2020

PROFESSIONAL EXPERIENCE

Dolby Laboratories Inc.	(Expected)
PhD Research Intern.	Summer 2026
31st Infantry Division Human Resources (Financial & Personnel Administrator)	2011
Served military duty at the HQ in the Engineering battalion at Republic of Korea Army.	- 2013

TECHNICAL SKILLS

Language	C#, Python, C, C++, HLSL, Compute Shader, JavaScript, Java, Go
Tool/Framework/API	Unity, AR Foundation (ARCore/ARKit; Android/iOS/Meta Horizon OS/Vision OS), Cursor AI, OpenAI/Gemini API, Vuforia SDK, OpenGL, D3.js, WINAPI, MFC, WPF, MySQL, DB2, HTML, CSS

LANGUAGES

Korean	Native
English	Full professional working proficiency: TOEFL 110 (27/27/28/28)