YOONSANG KIM

yoonsakim@cs.stonybrook.edu | yoonsangkim.info | LinkedIn | Google Scholar

RESEARCH INTERESTS

I am an interdisciplinary researcher in visualization and applied AI, specializing in context-aware interfaces. My research combines visual computing and embodied interaction to support people across desktop, mobile, and XR environments. I develop LLM agents that use structured representations of user activity and environmental context to interpret user intent and provide context-sensitive agentic assistance. I ground interface design in elicited domain needs and develop functional prototypes, using mixed-method evaluation to examine usability and refine interaction workflows.

Keywords: XR/Spatial Interface | Human-centered AI | Context-aware Agent | HCI | Visualization | XR Privacy/Trust

EDUCATION

Stony Brook University — Stony Brook, NY, USA
Ph.D. Candidate., Computer Science — *Aug. 2020 – Present*
Advisor: Dr. Arie E. Kaufman

Stony Brook University — Stony Brook, NY, USA
M.S., Computer Science — *Aug. 2018 – May. 2020*
Advisor: Dr. Arie E. Kaufman

Darmstadt University of Applied Sciences — Darmstadt, Germany
Exchange Student in B.S., Computer Science — *Mar. 2015 – Jul. 2015*
(via Soongsil University Program)

Soongsil University — Seoul, Korea
B.S., Computer Science and Engineering — *Mar. 2010 – Feb. 2017*

RESEARCH EXPERIENCE

Dolby Laboratories — Atlanta, GA
PhD Research Intern, Advanced Technology Group — *May. 2026 – Present*

- Researching on agent-assisted spatial content creation workflow connecting multimodal user intent with 3D content generation, placement, editing, and cross-device delivery. ***[TMP9, TMP8]***
- Designing coordinate system-adaptive representations that preserve intent across platform/devices.
- Evaluating with early-stage prototypes to grasp how embodied interactions map with 3D authoring.

Stony Brook University — Stony Brook, NY
Research Assistant, Visualization Lab — *May. 2022 – Present*

- Proposed object-centric scene graphs for verbal instructions disambiguation with LLM agents. ***[C5]***
- Designed personalized ubiquitous, spatial prior-aware XR system with multimodal LLM. ***[C6, W4]***
- Prototyped interactive recommender system using RAG LLM for personalized AR experience. ***[W4]***
- Proposed socially unobtrusive conversational AI assistant for glassed-form factor wearable XR. ***[C6]***
- Investigated spatial computing (PC-2D vs MR) for network security apps with Apple Vision Pro. ***[TMP7]***
- Designed an AI-assisted user behavior analytics system using multimodal (visual, audio) cues. ***[J4]***
- Implemented hand-held system (tablet, mobile) for collaborative multi-user AR experience. ***[J3, C4]***
- Developed a novel design of OS-level access control system in AR for privacy-protection. ***[C3, W2]***
- Evaluated perception-informed (visual, aural) visualization and information placement. ***[J2, W3]***
- Conducted controlled and ‘‘in-the-wild’’ (N=150+) evaluations deriving patterns across subjects.
- Conduced research on personal context-aware system for cross-virtuality (cross-device, remote).

Stony Brook University — Stony Brook, NY
Graduate Student Researcher, Human-AI Interaction Lab & Visualization Lab — *Aug. 2019 – May. 2020*

- Conducted user evaluation for mobile wearable interface optimization. ***[C1, C2]***
- Studied platform/device-agnosticism for scientific (volume rendering) /information visualization.
- Explored the applications of gesture-based input in Virtual Reality using Leap motion.
- Designed Shark^2 algorithm (shape/location channel) for Unity C# to utilize across multi-platforms.

Soongsil University — Seoul, Korea
Undergraduate Student Researcher — *Mar. 2018 – Jul. 2018*

- Developed hand gesture recognizer for MR remote desktop settings.
- Designed VR remote desktop in C and Unity C# with virtual graphics card and WINAPI. ***[J1, W1]***

PUBLICATIONS

Peer-Reviewed Conference Papers

TMP9. Beyond the Screen: Designing Spatial Media from 2D Video with an Agent-Assisted Creation Workflow. **(Under Review)**

TMP8. EARS: Source-Level Audio Allocation for Movie Viewing Across a Screen and Smart Glasses. **(Under Review)**

TMP7. Evaluating Mixed Reality for Spatial and Analytical Network Security Tasks. **(Under Review)**

C6. SpeechLess: Micro-utterance with Personalized Spatial Memory-aware Assistant in Everyday Augmented Reality.
Yoonsang Kim, Devshree Jadeja, Divyansh Pradhan, Yalong Yang, Arie Kaufman.
In *Proceedings of the IEEE Conference on Virtual Reality and 3D User Interfaces*. **(IEEE VR 2026)**

C5. From Speech-to-Spatial: Grounding Utterances on A Live Shared View with Augmented Reality.
Yoonsang Kim, Divyansh Pradhan, Devshree Jadeja, Arie Kaufman.
In *Proceedings of the IEEE Conference on Virtual Reality and 3D User Interfaces*. **(IEEE VR 2026)**

C4. AuxiScope: Handheld Augmented Reality Tablet as an Auxiliary Display for Large-Scale Display Systems.
Matthew Castellana, Chahat Kalsi, **Yoonsang Kim**, Saeed Boorboor, Arie Kaufman.
In *Proceedings of the IEEE International Symposium on Mixed and Augmented Reality*. **(IEEE ISMAR 2025)**

C3. Erebus: Access Control for Augmented Reality Systems.
Yoonsang Kim, Sanket Goutam, Amir Rahmati, Arie Kaufman.
In *Proceedings of the USENIX Conference on Security Symposium*. **(USENIX Security 2023)**

C2. Modeling Two-Dimensional Touch Pointing. **Honorable Mention Award** 🏆
Yu-Jung Ko, Hang Zhao, **Yoonsang Kim**, IV Ramakrishnan, Shumin Zhai, Xiaojun Bi.
In *Proceedings of the ACM Symposium on User Interface Software and Technology*. **(ACM UIST 2020)**

C1. Using Bayes' Theorem for Command Input: Principle, Models, and Applications.
Suwen Zhu, **Yoonsang Kim**, Jingjie Zheng, Jennifer Yi Luo, Liuping Wang, Xiangmin Fan, Feng Tian, Xiaojun Bi.
In *Proceedings of the ACM Conference on Human Factors in Computing Systems*. **(ACM CHI 2020)**

Peer-Reviewed Journal Articles

J4. Explainable XR: Understanding User Behaviors of XR Environments using LLM-assisted Analytics Framework.
Yoonsang Kim, Zainab Aamir, Mithilesh Singh, Saeed Boorboor, Klaus Mueller, Arie Kaufman.
IEEE Transactions on Visualization and Computer Graphics. **(IEEE TVCG 2025)**

J3. Submerse: Visualizing Storm Surge Flooding Simulations in Immersive Display Ecologies.
Saeed Boorboor, **Yoonsang Kim**, Ping Hu, Josef M Moses, Brian A Colle, Arie Kaufman.
IEEE Transactions on Visualization and Computer Graphics. **(IEEE TVCG 2023)**

J2. VoxAR: Adaptive Visualization of Volume Rendered Objects in Optical See-Through Augmented Reality.
Saeed Boorboor, Matthew Castellana, **Yoonsang Kim**, Zhutian Chen, Johanna Beyer, Hanspeter Pfister, Arie Kaufman.
IEEE Transactions on Visualization and Computer Graphics. **(IEEE TVCG 2023)**

J1. Flexible Remote-Control Application for Virtual Reality using Virtual Graphics Driver and OpenCV.
Yoonsang Kim, Geunyeop Ha, Sangjun Lee.
International Journal of Applied Engineering Research. **(IJAER 2017)**

Peer-Reviewed Workshop & Posters

W4. Memento: Towards Proactive Visualization of Everyday Memories with Personal Wearable AR Assistant.
Yoonsang Kim, Yalong Yang, Arie Kaufman.
In *Proceedings of the IEEE Conference on Virtual Reality and 3D User Interfaces Abstracts and Workshops*. **(IEEE VRW 2026)**

W3. Evaluating Spatialized Auditory Cues for Rapid Attention Capture in XR. **Honorable Mention Award @ XRIOS Workshop** 🏆
Yoonsang Kim, Swapnil Dey, Arie Kaufman.
In *Proceedings of the IEEE Conference on Virtual Reality and 3D User Interfaces Abstracts and Workshops*. **(IEEE VRW 2026)**

W2. Design of Privacy Preservation System in Augmented Reality.
Yoonsang Kim, Saeed Boorboor, Amir Rahmati, Arie Kaufman.
IEEE Symposium on Visualization for Cyber Security. **(IEEE VizSec 2021)**

W1. Design of Remote-Control Application in Virtual Reality Environment using Virtual Graphic Driver and OpenCV.
Geunyeop Ha, **Yoonsang Kim**, Dongyeon Lee, Sangjun Lee.
Korean Institute of Information Scientists and Engineers. **(KIISE 2016)**

RESEARCH & TECHNICAL SKILLS

Research Methods	Mixed-method Studies, Controlled Experiments, In-the-wild Studies Interviews, Diary Studies, Survey Design, Qualitative/Inductive Coding, Behavioral Analysis
Programming Language/Tools	Python, C#, C, C++, HLSL, Compute Shader, JavaScript, Java, Go Unity, AR Foundation, ARCore, ARKit, Vuforia SDK, WebXR OpenGL, D3.js, WINAPI, MFC, WPF, HTML, CSS.
Deployment Platform/Devices	AR Glasses – *Meta Ray-Ban Gen1/Display*. XR Head-Mounted Display – *Meta Quest 1/2/3/Pro, Apple Vision Pro, Microsoft HoloLens 1/2, Magic Leap 1/2, HTC Vive Pro/Eyes, Google Cardboard, Samsung Gear VR* Hand-held AR – *Apple iPad Pro, iPhone, Samsung Galaxy S8/9/10/21/22* Large Wall Display – *Tiled-display (Reality Deck, Powerwall, FlexiCAVE)*.
Applied AI (API, Model, Assistive)	Agentic pipelines, RAG, MCP, agent tooling, multimodal, multi-agent orchestration, evaluation agents LangGraph, Claude Code, Cursor AI, OpenAI/Gemini/Claude APIs, DINO, Qwen3, Gemma 3, Llama3.

TEACHING EXPERIENCE

Instructor (CSE566: Virtual Reality) @ Stony Brook University	2026
Graduate Course Teaching Assistant (CSE566: Virtual Reality) @ Stony Brook University	2020 –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 – Operating System) @ Stony Brook University	2020

HONORS & AWARDS

Recognized for Outstanding Review @ ACM UIST 2026	2026
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

TALKS & MEDIA

Invited Talk: Context-aware User Interfaces Bridging Physical and Mediated Realities @ HKUST VisLab	2026
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

GRANT & PROPOSAL WRITING EXPERIENCE

NSF Grant: Contributed to drafting situated designs for human-centered contextualization – Under review	2026
Meta Award: Contributed to drafting visual privacy and access control in AR – Accepted	2022
ONR Grant: Led drafting cross-reality remote collaboration and context-aware industrial applications – Accepted	2022

PROFESSIONAL EXPERIENCE

Dolby Laboratories (Part-time) PhD Research Intern, Advanced Technology Group.	Aug. 2026 – Sep. 2026
Dolby Laboratories PhD Research Intern, Advanced Technology Group.	May. 2026 – Aug. 2026
The 31st Infantry Division Engineering Battalion Financial/Personnel Administrator, Human Resources, Republic of Korea Army.	2011 – 2013

LANGUAGES

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

ACADEMIC SERVICES

Reviewer

IEEE International Symposium on Mixed and Augmented Reality **(ISMAR)**	2025/26
IEEE Conference on Virtual Reality and 3D User Interfaces **(VR)**	2026/27
IEEE Pacific Visualization Conference **(PacificVis)**	2025
ACM Conference on Human Factors in Computing Systems **(CHI)**	2026/27
ACM Symposium on User Interface Software and Technology **(UIST)**	2025/26
ACM Interactive Surfaces and Spaces **(ISS)**	2025/26
ACM Designing Interactive Systems **(DIS)**	2026
ACM Symposium on Virtual Reality Software and Technology **(VRST)**	2025
ACM Symposium on Spatial User Interaction **(SUI)**	2025
ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies **(IMWUT)**	2025/26

Mentoring

Mentoring Graduate Students for Independent Study Research @ Stony Brook University 2020 – Present
Supervised and collaborated with 4 undergraduates and 20 graduate students on: *Wearable/Hand-held AR, Multi-sensory Perception, Context-aware Interface, AR Security, Cross-reality Collaboration, SLAM*.

Graduate Mentor of K-12 Energy Tech @ Center of Excellence in Wireless and Information Technology 2024 – 2025
Engaged with over 1,400 New York state high school students introducing immersive technologies.

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.

REFERENCES

Arie E. Kaufman (*ari@cs.stonybrook.edu*)	Distinguished Professor, Stony Brook University.
Yalong Yang (*yalong.yang@gatech.edu*)	Assistant Professor, Georgia Institute of Technology.
Amir Rahmati (*amir@cs.stonybrook.edu*)	Assistant Professor, Stony Brook University.
Anh Thai (*anh.thai@dolby.com*)	Senior Multimodal AI Researcher, Dolby Laboratories.