

YOONSANG KIM (Academic advisor: Dr. Arie E. Kaufman)

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RESEARCH INTERESTS

Multimodal interaction in XR | Cross-reality | Personalized Context-aware systems | Ubiquitous XR | Prototyping | XR Security and privacy

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

EDUCATION

Stony Brook University

Ph.D. Candidate., Computer Science (GPA: 3.83/4)

Stony Brook, NY
(Aug. 2020 – Present)

Stony Brook University

M.S., Computer Science (GPA: 3.68/4)

Stony Brook, NY
(Aug. 2018 – May. 2020)

Darmstadt University of Applied Sciences

Exchange Student (via Soongsil University Program)

Darmstadt, Germany
(Mar. 2015 – Jul. 2015)

Soongsil University

B.S., Computer Science and Engineering

Seoul, Korea
(Mar. 2010 – Feb. 2017)

RESEARCH AND TECHNICAL EXPERIENCE

Stony Brook University

Research Assistant

- Researched object-centric **spatial** relationships (**scene graph**) to disambiguate referents with **LLM agents**
- Researched the 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 applications 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 the local & remote **rendering** of **mapping** gigapixel/high dimensional data to **Tiled displays**
- Studied open-vocabulary **world mapping** and **synchronization** of XR **digital twin** coordinate systems

Stony Brook, NY
May. 2022 – Present

Graduate Student Researcher

- Studied platform/**device-agnostic** properties 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**

Stony Brook, NY
– May. 2020

Soongsil University

Undergraduate Student Researcher

- 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

Seoul, Korea
– Jul. 2018

PUBLICATIONS

- **Yoonsang Kim**, Divyansh Pradhan, Devshree Jadeja, Arie Kaufman.
From Speech-to-Spatial: Grounding Utterances on Live Shared View with Augmented Reality. (**Under review**).
- **Yoonsang Kim**, Devshree Jadeja, Divyansh Pradhan, Yalong Yang, Arie Kaufman.
Memento: Spatial Remembrance of Routine Memories with Conversational Personal Assistant in XR. (**Under review**).
- Doris Gutierrez, **Yoonsang Kim**, Amir Rahmati, Arie Kaufman.
Mixed Reality vs. 2D PC Interface for Network Security Tasks: A Comparative Study. (**Under review**)
- Matthew Castellana, Chahat Kalsi, **Yoonsang Kim**, Saeed Boorboor, Arie Kaufman.
[AuxiScope: Handheld Augmented Reality Tablet as an Auxiliary Display for Large-Scale Display Systems](#). IEEE ISMAR. 2025.
- **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 TVCG. 2025.
- Saeed Boorboor, **Yoonsang Kim**, Ping Hu, Josef M Moses, Brian A Colle, Arie Kaufman.
[Submerse: Visualizing Storm Surge Flooding Simulations in Immersive Display Ecologies](#). IEEE TVCG. 2023.
- 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 TVCG. 2023.
- **Yoonsang Kim**, Sanket Goutham, Amir Rahmati, Arie Kaufman.
[Erebus: Access Control for Augmented Reality Systems](#). USENIX Security. 2023.

- **Yoonsang Kim**, Saeed Boorboor, Amir Rahmati, Arie Kaufman. [Design of Privacy Preservation System in Augmented Reality](#). IEEE VizSec Poster. 2021.
- Yu-Jung Ko, Hang Zhao, **Yoonsang Kim**, IV Ramakrishnan, Shumin Zhai, Xiaojun Bi. [Modeling Two-Dimensional Touch Pointing](#). ACM UIST. 2020.
- 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](#). ACM CHI. 2020.
- **Yoonsang Kim**, Geunyeop Ha, Sangjun Lee. [Flexible Remote-Control Application for Virtual Reality using Virtual Graphics Driver and OpenCV](#). IJAER. 2017.

ACADEMIC SERVICES

- Reviewer of IEEE ISMAR (*Recognized for Outstanding Reviews*) 2025 (*Currently Serving*)
- Reviewer of IEEE VR 2025 (*Currently Serving*)
- Reviewer of IEEE PacificVIS 2025 (*Currently Serving*)
- Reviewer of ACM CHI 2025 (*Currently Serving*)
- Reviewer of ACM ISS 2025 (*Currently Serving*)
- Reviewer of ACM UIST 2025 (*Currently Serving*)
- Reviewer of ACM IMWUT 2025 (*Currently Serving*)
- Reviewer of ACM SUI 2025 (*Currently Serving*)
- Reviewer of ACM VRST 2025 (*Currently Serving*)

HONORS AND AWARDS

- Best Data Science/AI Award. SBU Hackathon. Stony Brook University Sep. 2019
- Dean's Award. Software Competition. Soongsil University Oct. 2016
- National Semi-Finalist. Microsoft Imagine Cup. Microsoft Korea Mar. 2016
- Gold Award. IT-BT Software Convergence Engineering Competition. Soongsil University Dec. 2015

TEACHING AND LEADERSHIP EXPERIENCE

Stony Brook University

Stony Brook, NY

Research Mentor

- Mentored 2 high school, 4 undergraduate, and 15 graduate students on the domains of Mobile AR, Personalized XR, User interface, and Context-aware visualization – Present

Graduate Mentor: K-12 Energy Tech

– Nov. 2025

- Engaged with over 1400 high school students around the state (New York) on immersive technologies

Teaching Assistant

– May. 2022

- Assisted lecture/assignment preparation for professors of courses (VR, HCI, Visualization, OS)

Soongsil University

Seoul, Korea

Exchange Student Program Mentor

– Dec. 2016

- Helped the incoming students of exchange student program & shared experience

Republic of Korea Army (The 31st Infantry Division Engineering Battalion)

Gwangju, Korea

Financial & Personnel Administrator in Human Resources

– Jan. 2013

- Served military duty at the HQ in the Engineering battalion as Financial & Personnel administrator

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) |