YOONSANG KIM

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RESEARCH INTERESTS

Cross-platform/device-agnostic systems for AR/VR/MR | Context-aware immersive visualization | Ubiquitous XR | Intelligent interface | Prototyping | Security and privacy in digital twin

Keywords: AR | MR | Intelligent Interface | Human-centered AI | Ubiquitous Computing | Visualization | XR Security/Privacy

EDUCATION

Stony Brook University — Stony Brook, NY
Ph.D. Candidate., Computer Science — Aug. 2020 – Present

Stony Brook University — Stony Brook, NY
M.S., Computer Science — May. 2020

Darmstadt University of Applied Sciences — Darmstadt, Germany
Exchange Student (via Soongsil University Program) — Jul. 2015

Soongsil University — Seoul, Korea
B.S., Computer Science and Engineering — Feb. 2017

RESEARCH AND TECHNICAL EXPERIENCE

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

- Designing next generation **ubiquitous** interface and **context-aware** XR using multimodal LLM
- Prototyping **interactive** recommender system using **RAG LLM** for **personalized** AR experience
- Conducting research on **context-aware adaptive** UI **across virtuality** (cross-device, co-located, remote)
- Researching **conversational, cross-reality** (AR/MR-to-VR) interface for remote **collaboration**
- Investigating **spatial computing** for network security applications using Apple Vision Pro
- 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
- Proposed a novel mobile AR framework for **co-located collaboration** in immersive **tiled displays**
- Developed a novel design of OS-level **access control** system in AR for **privacy-protection**
- Explored the applications of local & remote **rendering**
- Explored **situated visualization** for optimal volume **placement**
- Studied **mapping/synchronization** of coordinate systems in **digital twin**

Graduate Student Researcher — Stony Brook, NY, May. 2020

- 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**

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

- 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

- **Yoonsang Kim**, Prantik Howlader, Yalong Yang, Arie Kaufman. IEEE ISMAR. 2025. **(Under Review)**
- Matthew Castellana, Chahat Kalsi, **Yoonsang Kim**, Saeed Boorboor, Arie Kaufman. IEEE ISMAR. 2025. **(Under Review)**
- **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 VR (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. 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. 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 — 2025 (Currently Serving)
- Reviewer of ACM ISS — 2025 (Currently Serving)
- Reviewer of ACM UIST — 2025 (Currently Serving)
- Reviewer of ACM IMWUT — 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

LEADERSHIP EXPERIENCE

Stony Brook University — Stony Brook, NY
Teaching Assistant — May. 2022

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

Research Mentor

- Mentored 2 high school, 4 undergraduate, and 6 graduate students to design an algorithm in the domains of Mobile AR, Device localization in AR, User interface, and Information visualization

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 — 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), 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)
German	Elementary proficiency : A1(Beginner level)