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

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RESEARCH INTERESTS

Multimodal interaction in XR | Cross-platform XR | 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 — Stony Brook, NY
Ph.D. Candidate., Computer Science (GPA: 3.83/4) — *(Aug. 2020 – Present)*

Stony Brook University — Stony Brook, NY
M.S., Computer Science (GPA: 3.68/4) — *(Aug. 2018 – May. 2020)*

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

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

RESEARCH AND TECHNICAL EXPERIENCE

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

- 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
- Conduced 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

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 — Seoul, Korea
Undergraduate Student Researcher — *– 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**, 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 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. 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 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*

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 12 graduate students to design an algorithm in the domains of Mobile AR, Personalized XR, User interface, and Context-aware 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 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)
German	Elementary proficiency: A1(Beginner level)