

YOONSANG KIM

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RESEARCH INTERESTS

User collaboration/interaction in immersive environments | Cross-platform/device-agnostic systems for AR/VR/MR

Context-aware information visualization | Intelligent interface | Prototyping | Security and privacy in digital twin

Keywords : AR | MR | Intelligent Interface | Collaboration in XR | Human-centered AI | HCI | Visualization | XR Security/Privacy

EDUCATION

Stony Brook University

Ph.D. Candidate., Computer Science

Stony Brook, NY

Aug. 2020 – Present

Stony Brook University

M.S., Computer Science

Stony Brook, NY

May. 2020

Darmstadt University of Applied Sciences

Exchange Student (via Soongsil University Program)

Darmstadt, Germany

Jul. 2015

Soongsil University

B.S., Computer Science and Engineering

Seoul, Korea

Feb. 2017

RESEARCH AND TECHNICAL EXPERIENCE

Stony Brook University

Research Assistant

Stony Brook, NY

May. 2022 – Present

- Conducting research on **context-aware adaptive UI across virtuality** (cross-device, co-located, remote)
- Investigating **spatial computing** for network security applications using Apple Vision Pro
- Developing **cross-reality** (AR/MR-to-VR) remote **collaboration** system using Gaussian Splatting
- Prototyping **conversational** recommender system using **RAG LLM** for **personalized** AR experience
- 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 **privacy-protection** in Augmented Reality
- 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/**information visualization**
- Explored applications of the platform & designed a **volume renderer** (HLSL/Compute) in Unity
- 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

- Conducted performance analysis of an object detection/segmentation model and its portability to lightweight computation environment (**Mobile/Untethered VR HMD**)
- 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**, Zainab Aamir, Mithilesh Singh, Saeed Boorboor, Klaus Mueller, Arie Kaufman. IEEE VR. 2025. (**Under Review**)
- 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 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.

TECHNICAL SKILLS

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

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 5 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

The 31st Infantry Division Engineering Battalion Gwangju, Korea
Financial & Personnel Administrator (Human Resources) Jan. 2013

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

LANGUAGES

Korean Native
English Full professional working proficiency : TOEFL 110 (27/27/28/28)
German Elementary proficiency : A1(Beginner level)