

# YOONSANG KIM

[yoonsakim@cs.stonybrook.edu](mailto:yoonsakim@cs.stonybrook.edu) | [linkedin.com/in/yoonsang-kim-jake/](https://linkedin.com/in/yoonsang-kim-jake/) | [yoonsangkim.info/](http://yoonsangkim.info/)

## RESEARCH INTERESTS

Multimodal interaction in XR | Cross-reality | Personalized Context-aware systems | Ubiquitous XR | Prototyping | XR Privacy  
**Keywords:** AR | MR | XR | Personal Context-aware | Human-centered AI | Ubiquitous Computing | User Interface | User Privacy

## EDUCATION

<b>Stony Brook University</b> <i>Ph.D. Candidate., Computer Science</i> <i>Advisor: Arie E. Kaufman</i>	Stony Brook, NY, USA Aug. 2020 – Present
<b>Stony Brook University</b> <i>M.S., Computer Science</i> <i>Advisor: Xiaojun Bi, Arie E. Kaufman</i>	Stony Brook, NY, USA Aug. 2018 – May. 2020
<b>Darmstadt University of Applied Sciences</b> <i>Exchange Student in B.S., Computer Science</i> (via Soongsil University Program)	Darmstadt, Germany Mar. 2015 – Jul. 2015
<b>Soongsil University</b> <i>B.S., Computer Science and Engineering</i>	Seoul, Korea Mar. 2010 – Feb. 2017

## RESEARCH EXPERIENCE & DETAILS

<b>Stony Brook University</b> <i>Research Assistant</i>	Stony Brook, NY, USA May. 2022 – Present
<ul style="list-style-type: none"> <li>• Designed object-centric <b>spatial graphs</b> (<b>scene graph</b>) to disambiguate referents with LLM <b>agents</b></li> <li>• Researched mapping of embodied interactions (<b>speech and gesture</b>) to <b>spatial</b> representations in AR</li> <li>• Designed <b>socially unobtrusive</b> conversational AI <b>assistant</b> for glassed-form factor <b>wearable XR</b></li> <li>• Designed personalized <b>ubiquitous, spatial prior-aware</b> XR system with multimodal LLM</li> <li>• Prototyped interactive recommender system using <b>RAG LLM</b> for <b>personalized</b> AR experience</li> <li>• Conducted research on <b>personal context-aware</b> system for cross-virtuality (cross-device, remote)</li> <li>• Researched <b>conversational, cross-reality</b> (AR-to-VR) interface for remote <b>collaboration</b></li> <li>• Investigated <b>spatial computing</b> (PC-2D vs MR) for network security apps with Apple Vision Pro</li> <li>• Conducted <b>controlled</b> and “<b>in-the-wild</b>” (N=150+) evaluations deriving patterns across subjects</li> <li>• Designed end-to-end <b>analytics</b> framework for user behaviors in XR environments (AR, VR, MR) using <b>multimodal (visual, audio, interaction) cues</b></li> <li>• Implemented hand-held system (tablet, mobile) for <b>collaborative</b> multi-user AR experience</li> <li>• Developed a novel design of OS-level <b>access control</b> system in AR for <b>privacy-protection</b></li> <li>• Explored local &amp; remote <b>rendering</b> of <b>mapping</b> gigapixel/high dimensional data to <b>Tiled displays</b></li> <li>• Studied open-vocabulary <b>world mapping &amp; synchronization</b> of XR <b>digital twin</b> coordinate systems</li> </ul>	
<i>Graduate Student Researcher</i>	Stony Brook, NY, USA – May. 2020
<ul style="list-style-type: none"> <li>• Studied platform/<b>device-agnosticism</b> for scientific (volume rendering) /information <b>visualization</b></li> <li>• Explored the applications of <b>gesture-based input</b> in Virtual Reality using Leap motion</li> <li>• Designed Shark<sup>2</sup> algorithm (shape/location channel) for Unity C# to utilize across <b>multi-platforms</b></li> </ul>	
<b>Soongsil University</b> <i>Undergraduate Student Researcher</i>	Seoul, Korea – Jul. 2018
<ul style="list-style-type: none"> <li>• Developed <b>hand gesture recognizer</b> for MR <b>remote desktop</b> settings</li> <li>• Developed an <b>immersive remote</b> desktop screen <b>network streaming</b> system in C and Unity C# utilizing virtualized graphics card and WINAPI hooking</li> </ul>	

## PUBLICATIONS

### Peer-Reviewed Conference Papers

- C6. **Yoonsang Kim**, Devshree Jadeja, Divyansh Pradhan, Yalong Yang, Arie Kaufman.  
SpeechLess: Micro-utterance with Personalized Spatial Memory-aware Assistant in Everyday Augmented Reality.  
In *Proceedings of the IEEE Conference on Virtual Reality and 3D User Interfaces. (IEEE VR 2026)*
- C5. **Yoonsang Kim**, Divyansh Pradhan, Devshree Jadeja, Arie Kaufman.  
From Speech-to-Spatial: Grounding Utterances on Live Shared View with Augmented Reality.  
In *Proceedings of the IEEE Conference on Virtual Reality and 3D User Interfaces. (IEEE VR 2026)*

- C4. Matthew Castellana, Chahat Kalsi, **Yoonsang Kim**, Saeed Boorboor, Arie Kaufman.  
[AuxiScope: Handheld Augmented Reality Tablet as an Auxiliary Display for Large-Scale Display Systems.](#)  
*In Proceedings of the IEEE International Symposium on Mixed and Augmented Reality. (IEEE ISMAR 2025)*
- C3. **Yoonsang Kim**, Sanket Goutham, Amir Rahmati, Arie Kaufman.  
[Erebus: Access Control for Augmented Reality Systems.](#)  
*In Proceedings of the USENIX Conference on Security Symposium. (USENIX Security 2023)*
- C2. Yu-Jung Ko, Hang Zhao, **Yoonsang Kim**, IV Ramakrishnan, Shumin Zhai, Xiaojun Bi. **Honorable Mention Award**   
[Modeling Two-Dimensional Touch Pointing.](#)  
*In Proceedings of the ACM Symposium on User Interface Software and Technology. (ACM UIST 2020)*
- C1. 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.](#)  
*In Proceedings of the ACM Conference on Human Factors in Computing Systems. (ACM CHI 2020)*

## Peer-Reviewed Journal Articles

- J4. **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 Transactions on Visualization and Computer Graphics. (IEEE TVCG 2025)*
- J3. 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 Transactions on Visualization and Computer Graphics. (IEEE TVCG 2023)*
- J2. 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 Transactions on Visualization and Computer Graphics. (IEEE TVCG 2023)*
- J1. **Yoonsang Kim**, Geunyeop Ha, Sangjun Lee.  
[Flexible Remote-Control Application for Virtual Reality using Virtual Graphics Driver and OpenCV.](#)  
*International Journal of Applied Engineering Research. (IJAER 2017)*

## Peer-Reviewed Workshop & Posters

- W4. **Yoonsang Kim**, Yalong Yang, Arie Kaufman.  
[Memento: Towards Proactive Visualization of Everyday Memories with Personal Wearable AR Assistant.](#)  
*In Proceedings of the IEEE Conference on Virtual Reality and 3D User Interfaces Abstracts and Workshops. (IEEE VRW 2026)*
- W3. **Yoonsang Kim**, Swapnil Dey, Arie Kaufman.  
[Evaluating Spatialized Auditory Cues for Rapid Attention Capture in XR.](#)  
*In Proceedings of the IEEE Conference on Virtual Reality and 3D User Interfaces Abstracts and Workshops. (IEEE VRW 2026)*
- W2. **Yoonsang Kim**, Saeed Boorboor, Amir Rahmati, Arie Kaufman.  
[Design of Privacy Preservation System in Augmented Reality.](#)  
*IEEE Symposium on Visualization for Cyber Security. (IEEE VizSec 2021)*
- W1. Geunyeop Ha, **Yoonsang Kim**, Dongyeon Lee, Sangjun Lee.  
[Design and Implementation of Remote-Control Application in Virtual Reality Environment using Virtual Graphic Driver and OpenCV.](#)  
*Korean Institute of Information Scientists and Engineers. (KIISE 2016)*

## SERVICES

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### Reviewer

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

### Leadership

<b>Mentoring Graduate Students for Independent Study Research @ Stony Brook University</b>	2020
Supervised and collaborated with 4 undergraduates and 17 graduate students on: Wearable/Hand-held AR, Multi-sensory Perception, Context-aware Interface, AR Security, Cross-reality Collaboration, SLAM.	- Present
<b>Graduate Mentor of K-12 Energy Tech @ Center of Excellence in Wireless and Information Technology</b>	2024
Engaged with over 1,400 New York state high school students introducing immersive technologies.	- 2025
<b>KidOYO Summer Mentoring Program @ Stony Brook University</b>	2022
Mentored 2 high school students on designing a remote visualization tool with hand-held AR and tiled display.	
<b>Exchange Student Program Mentor @ Soongsil University</b>	2016
Assisted incoming students of exchange student program to settle into local community and academic life.	

## **HONORS & AWARDS**

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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

## **MEDIA & EXPOSURE**

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Weathering the Storm: How SBU's Climate Research Is Shaping Long Island's Future @ <a href="#">Stony Brook University News</a>	2025
Naval Science and Technology: Growing Energy Resiliency Through Research @ <a href="#">Future Force Magazine (Vol. 9, No. 1)</a>	2023
Reality Deck Helps Researchers Visualize and Predict Storm Surge Emergencies @ <a href="#">Stony Brook University News</a>	2022

## **TEACHING EXPERIENCE**

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Instructor (CSE566: Virtual Reality) @ Stony Brook University ( <b>Expected</b> )	2026
	2020
Graduate Course Teaching Assistant (CSE566: Virtual Reality) @ Stony Brook University	- 2023
Graduate Course Teaching Assistant (CSE518: Visualization) @ Stony Brook University	2021
Graduate Course Teaching Assistant (CSE518: Human Computer Interaction) @ Stony Brook University	2021
Undergraduate Teaching Assistant (CSE320: Systems Fundamental II – Operating System) @ Stony Brook University	2020

## **PROFESSIONAL EXPERIENCE**

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[Will-be-disclosed-in-the-near-future] ( <b>Expected</b> )	2026
Research Intern.	
<b>31<sup>st</sup> Infantry Division Human Resources (Financial &amp; Personnel Administrator)</b>	2020
Served military duty at the HQ in the Engineering battalion at Republic of Korea Army.	- 2023

## **TECHNICAL SKILLS**

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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**

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