

인간중심 지능형 시스템 연구실

Human-Centered
Intelligent Systems Lab.



김승준
교수

seungjun@gist.ac.kr

062-715-5331

<https://sites.google.com/view/gist-hcis-lab>



Education

- 2006** 2006 Ph.D. in Mechatronics, GIST
- 2000** 2000 M.S. in Mechatronics, GIST
- 1998** 1998 B.S. in Electrical and Electronics Engineering, KAIST

Experience

- 2023 ~ 2024** Visiting Scientist, Computer Science & Artificial Intelligence Laboratory (CSAIL), MIT
- 2021 ~** Associate Professor, School of Integrated Technology, GIST
- 2017 ~ 2021** Assistant Professor, School of Integrated Technology, GIST
- 2011 ~ 2017** Systems Scientist, Human-Computer Interaction Institute (HCII), School of Computer Science, Carnegie Mellon University
- 2006 ~ 2011** Postdoc, Human-Computer Interaction Institute (HCII), School of Computer Science, Carnegie Mellon University
- 2003** Visiting Research Fellow, Ergonomics in Tele-operation and Control Lab., Dept. of Mechanical and Industrial Engineering, University of Toronto, Canada
- 2002** Visiting Research Fellow, Human Friendly Systems Research Group, Intelligent Systems Institute in National Institute of Advanced Industrial Science and Technology (AIST), Japan

Professional Activities & Honors

- 2020 & 2021** GIST's Research Highlights of the Year / GIST Achievement Award
- 2012 & 2015** Research Featured in the Media - CNN: What's Next / Wall Street Journal / MIT Technology Review / The Economist
- 2011 ~** Journal Editor / Peer Reviewer (CHI, UIST, IMWUT, Sensors, etc)
- 2010** Automotive UI Program Committee (Local Organizer)

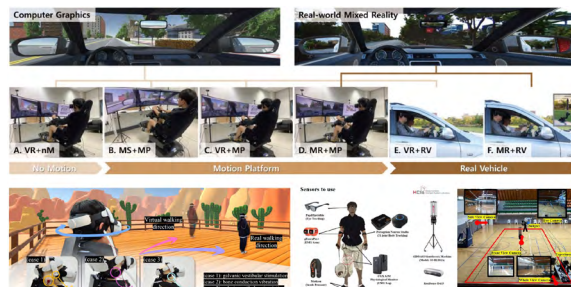
연구실 소개

본 연구실은 인간-컴퓨터 상호작용(HCI)과 인공지능(AI) 기술을 융합하여 인간과 물리 시스템의 인터랙션을 '사람중심'으로 설계하고 실증하는 학제간 융합연구를 수행합니다.

컴퓨터 과학, 전기전자, 기계공학 뿐 아니라, HCI, XR, AI, UI/UX 전문인력이 협업합니다. 특히, 인공지능의 판단과 결정이 사용자의 경험을 생성하는 메커니즘을 학습하고, 각종 센싱, 트래킹, 자극기술을 바탕으로 사용자 행동, 상태, 맥락을 이해하는 초실감 인터랙션 기술을 중점으로 연구합니다.

중점분야

- HCI (Human-Computer Interaction) + Human-Centered AI (Explainable/Responsible)
- Interactive, Mobile, Wearable, Ubiquitous Technology
- Human-AI Teaming / MetaHuman (NeRF) / XR Perception / Vehicular-Metaverse
- XR Twin Platforms for AI-Infused Physical Systems (Vehicles, Robots, Cities)
- ActionNet / Multi-Modal Stimulation / Social Telepresence / Seamless VR Locomotion



연구 성과

수행중인 주요 연구과제 (주요과제경력)

- XR 메타버스 모빌리티 경험 증강을 위한 플랫폼 및 초실감 콘텐츠 개발 (2021-2024), RAPA
- Stylized 뉴럴 렌더링 기반 3D 메타휴먼 생성기술 개발 (2023), KETI
- 인공지능 기반 메타버스 구현을 위한 융·복합 문화 가상 스튜디오 (2022-2026), Innopolis
- 인간중심 물리 시스템 설계를 위한 HCI+AI 융합연구 (2021-2025), GIST-MIT 공동연구
- 메타버스 산업현장 내 실감 이동 및 상호작용 지원 NUI 개발 (2022), KETI
- 온라인 게임 콘텐츠 제작 지원을 위한 인공지능 기반 게임 시뮬레이션 기술 개발 (2022~2024), KOCCA
- 자율주행 차량 기반 다수 시나리오 실시간 인터랙티브 콘텐츠 및 플랫폼 기술 개발 (2020-2022), KOCCA
- 지능형 차량의 사람중심 서비스 및 인터랙션 기술 개발 (2020), GIST AI
- 자율주행차량의 기계지능과 운전자의 친화적 인터랙션을 지원하는 차량용 CHS 설계 (2019), GIST AI
- 공공안내 표지판의 맥락적 시인성 평가 방법 및 도구 개발 (2019~2021), KOCCA
- What, When, How: A Sensor-based Driver Awareness System to Improve HCI in Vehicles (2014~2017), USDOT
- Interaction Techniques for the Elder Drivers (2009~2015), NSF Quality of Life Engineering Research Center

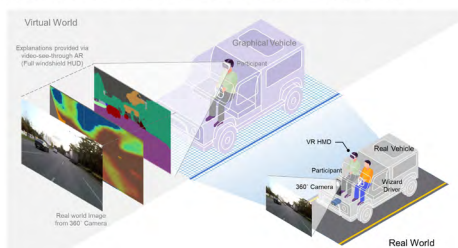
주요논문 (대표실적)

- ErgoPulse: Electrifying Your Lower Body With Biomechanical Simulation-based Electrical Muscle Stimulation Haptic System in Virtual Reality (ACM CHI 2024)
- SYNC-VR: Synchronizing Your Senses to Conquer Motion Sickness for Enriching In-Vehicle Virtual Reality (ACM CHI 2024)
- LumiMood: A Creativity Support Tool for Designing the Mood of a 3D Scene (ACM CHI 2024)
- Effect of Optical Flow and User VR Familiarity on Curvature Gain Thresholds for Redirected Walking (Virtual Reality)
- Enhancing Seamless Walking in Virtual Reality: Application of Bone-Conduction Vibration in Redirected Walking (IEEE ISMAR 2023)
- What and When to Explain? On-Road Evaluation of Explanations in Highly Automated Vehicles (ACM IMMUT 2023)
- Designing Virtual Agent Human-Machine Interfaces Depending on the Communication and Anthropomorphism Levels in Augmented Reality (ACM AutoUI 2023)
- Team Badminton at IJCAI CoachAI Badminton Challenge 2023: Multi-Layer Multi-Input Transformer Network (MuLMINet) with Weighted Loss (IJCAI 2023)
- Electrical, Vibrational, and Cooling Stimuli-Based Redirected Walking: Comparison of Various Vestibular Stimulation-Based Redirected Walking Systems (ACM CHI 2023)
- Giant Finger: Visuo-Proprioceptive Congruent Virtual Legs for Flying Actions in Virtual Reality (IEEE VR poster 2023)
- Auditory and Olfactory Stimuli-Based Attractors to Induce Reorientation in VR Locomotion (ACM CHI LBW 2022)
- REVES: Redirection Enhancement Using Four-Pole Vestibular Electrode Stimulation (ACM CHI LBW 2022)
- Toward Immersive Self-Driving Simulations: Reports from a User Study across Six Platforms (ACM CHI 2020)
- A Crowdsourcing System for the Elderly: A Gamified Approach to Speech Collection (ACM CHI LBW 2020)
- Making Machine Learning Applications for Time-Series Sensor Data Graphical and Interactive (ACM TiIS 2017)
- Integrated Driving Aware System in the Real-World: Sensing, Computing and Feedback (ACM CHI EA 2016)
- Sensors Know When to Interrupt You in the Car (ACM CHI 2015)
- Usability of Car Dashboard Displays for Elder Drivers (ACM CHI 2011)
- Psychophysiological Measures for assessing Cognitive Load (ACM Ubicomp 2010)
- Simulated AR Windshield Display as a Cognitive Mapping Aid for Elder Driver Navigation (ACM CHI 2009)

융합연구 및 비전

우리 일상생활 공간에서 자율주행 차량, 메타버스 플랫폼, 초연결 XR 콘텐츠, 대화형 AI 시스템, 실가상 사회약자 지원 시스템과 상호작용할 때 발생하는 기술 이슈, 사회이슈를 정의하고, '사람중심' 솔루션을 제시할 수 있는 융합인재 배출을 목표로 합니다.

- ① 자율주행 차량의 사람중심 지능화, 탑승객 상호작용 설계
- ② XR Twin 기반의 실감 주행·보행 메타모빌리티 기술



- ③ 메타버스 공간의 공감각 증강 및 메타휴먼 상호작용 기술
- ④ 복합 감각 제공 기술, 현실-가상 행동 반영 기술 개발

