

Sangmin Lee

Postdoctoral Researcher at UIUC

✉ sangminl@illinois.edu 🌐 sites.google.com/view/sangmin-lee

RESEARCH INTERESTS

My research interests lie in expanding machine capabilities through *multimodal perception* and *minimal supervision*. I investigate multimodal learning to comprehensively leverage visual, language, audio, and physiological signals for holistic reasoning. Furthermore, I explore self-supervised learning to effectively derive feature representations even from weakly-labeled or unlabeled data. Building upon these foundations, my current research focuses on developing *socially intelligent machines* that can understand and interact with humans in social contexts seamlessly.

Multimodal Learning

- Visual+Language/Audio/Physiology

Self-supervised Learning

- Weakly-labeled/Unlabeled Data

Social Artificial Intelligence

- Social Understanding/Reasoning

EXPERIENCE

Georgia Institute of Technology (Georgia Tech)

- Affiliated Researcher in Interactive Computing

Oct 2023 - Present

University of Illinois Urbana-Champaign (UIUC)

- Postdoctoral Researcher in Computer Science

- Advisor: Prof. James M. Rehg

May 2023 - Present

EDUCATION

Korea Advanced Institute of Science and Technology (KAIST)

- Ph.D. in Electrical Engineering

- Advisor: Prof. Yong Man Ro

Feb 2017 - Feb 2023

Yonsei University

- B.S. in Electrical & Electronic Engineering

Mar 2012 - Feb 2017

PUBLICATIONS

- Modeling Multimodal Social Interactions: New Challenges and Baselines with Densely Aligned Representations**
Sangmin Lee, Bolin Lai, Fiona Ryan, Bikram Boote, James M. Rehg
CVPR 2024 (Oral Presentation) [Acceptance Rate 0.8%]
- Learning to Visually Localize Sound Sources from Mixtures without Prior Source Knowledge**
Dongjin Kim*, Sung Jin Um*, **{Sangmin Lee[†], Jung Uk Kim[†]}** ([†] **Corresponding Author**)
CVPR 2024
- Audio-Visual Mismatch-Aware Video Retrieval via Association and Adjustment**
Sangmin Lee, Sungjune Park, and Yong Man Ro
ECCV 2022
- Weakly Paired Associative Learning for Sound and Image Representations via Bimodal Associative Memory**
Sangmin Lee, Hyung-Il Kim, and Yong Man Ro
CVPR 2022
- Video Prediction Recalling Long-term Motion Context via Memory Alignment Learning**
Sangmin Lee, Hak Gu Kim, Dae Hwi Choi, Hyung-Il Kim, and Yong Man Ro
CVPR 2021 (Oral Presentation) [Acceptance Rate 4%]
Samsung HumanTech Paper Award, Competition Rate 17:1
- CUA Loss: Class Uncertainty-Aware Gradient Modulation for Robust Object Detection**
Jung Uk Kim, Seong Tae Kim, Hong Joo Lee, **Sangmin Lee**, and Yong Man Ro
IEEE TCSVT 2021

7. **Assessing Individual VR Sickness through Deep Feature Fusion of VR Video and Physiological Response**
Sangmin Lee, Seongyeop Kim, Hak Gu Kim, and Yong Man Ro
IEEE TCSVT 2021
8. **Towards a Better Understanding of VR Sickness: Physical Symptom Prediction for VR Contents**
 Hak Gu Kim, Sangmin Lee, Seongyeop Kim, Heoun-taek Lim, and Yong Man Ro
AAAI 2021
9. **Visual Comfort Aware-Reinforcement Learning for Depth Adjustment of Stereoscopic 3D Images**
 Hak Gu Kim, Minho Park, Sangmin Lee, Seongyeop Kim, and Yong Man Ro
AAAI 2021
10. **SACA Net: Cybersickness Assessment of Individual Viewers for VR Content via Graph-based Symptom Relation Embedding**
Sangmin Lee, Jung Uk Kim, Hak Gu Kim, Seongyeop Kim, and Yong Man Ro
ECCV 2020
11. **Structure Boundary Preserving Segmentation for Medical Image with Ambiguous Boundary**
 Hong Joo Lee, Jung Uk Kim, Sangmin Lee, Hak Gu Kim, and Yong Man Ro
CVPR 2020
12. **Video Frame Interpolation via Exceptional Motion-aware Synthesis**
 Minho Park, Sangmin Lee, and Yong Man Ro
ICASSP 2020 (Oral Presentation)
13. **BMAN: Bidirectional Multi-scale Aggregation Networks for Abnormal Event Detection**
Sangmin Lee, Hak Gu Kim, and Yong Man Ro
IEEE TIP 2020
14. **Robust Video Frame Interpolation with Exceptional Motion Map**
 Minho Park, Hak Gu Kim, Sangmin Lee, and Yong Man Ro
IEEE TCSVT 2020
15. **Estimating VR Sickness Caused by Camera Shake in VR Videography**
 Seongyeop Kim, Sangmin Lee, and Yong Man Ro
ICIP 2020 (Oral Presentation)
16. **Physiological Fusion Net: Quantifying Individual VR Sickness with Content Stimulus and Physiological Response**
Sangmin Lee, Seongyeop Kim, Hak Gu Kim, Min Seob Kim, Seokho Yun, Bumseok Jeong, and Yong Man Ro
ICIP 2019
17. **Deep Objective Assessment Model Based on Spatio-temporal Perception of 360-Degree Video for VR Sickness Prediction**
 {Kihyun Kim*, Sangmin Lee*}, Hak Gu Kim, Minho Park, and Yong Man Ro (*** Equal Contribution**)
ICIP 2019 (Oral Presentation)
ICIP Best Paper Finalist, Top 1% of Submissions
18. **VRSA Net: VR Sickness Assessment considering Exceptional Motion for 360-degree VR Video**
 Hak Gu Kim, Heoun-taek Lim, Sangmin Lee, and Yong Man Ro
IEEE TIP 2019
19. **On-the-Fly Facial Expression Prediction using LSTM Encoded Appearance-Suppressed Dynamics**
 Wissam J. Baddar, Sangmin Lee, and Yong Man Ro
IEEE TAFFC 2019
20. **STAN: Spatio-temporal Adversarial Networks for Abnormal Event Detection**
Sangmin Lee, Hak Gu Kim, and Yong Man Ro
ICASSP 2018 (Oral Presentation)

PATENTS

1. **Method for Video Frame Interpolation Robust to Exceptional Motion and the Apparatus Thereof**
Korea Patent 2244187 / **PCT Patent App.** 003461

2. **Method for VR Sickness Assessment Considering Neural Mismatch Model and the Apparatus Thereof**
Korea Patent 2284266 / *US Patent* 11699072
3. **Apparatus and Method for Virtual Reality Sickness Reduction Based on Virtual Reality Sickness Assessment**
Korea Patent 2291257 / *US Patent* 11252371
4. **Video Sequences Generating System Using Generative Adversarial Networks and the Method Thereof**
Korea Patent 2095097

AWARDS & HONORS

1st Place Winner of Ad-hoc Video Search Competition - 11th Video Browser Showdown (International Challenge)	2022
Samsung HumanTech Paper Award, Honor Prize (\$2,000) - Samsung Electronics	2021
Outstanding Project Selection (Graduate Project Lead) - Institute of Information & communications Technology Planning & Evaluation (IITP)	2020
Outstanding TA Award (2 Times) - Korea Advanced Institute of Science and Technology (KAIST)	2019, 2020
ICIP Best Paper Finalist - IEEE International Conference on Image Processing (ICIP)	2019
ICIP Top 10% Paper Selection - IEEE International Conference on Image Processing (ICIP)	2019
National Government Fellowship - Government of South Korea	2017 - 2023

PROFESSIONAL ACTIVITIES

Reviewer

- Conference on Computer Vision and Pattern Recognition (CVPR)
- International Conference on Computer Vision (ICCV)
- European Conference on Computer Vision (ECCV)
- Medical Image Computing and Computer Assisted Intervention (MICCAI)
- IEEE Transactions on Image Processing (TIP)
- IEEE Transactions on Neural Networks and Learning Systems (TNNLS)
- IEEE Transactions on Circuits and Systems for Video Technology (TCSVT)
- IEEE Transactions on Visualization and Computer Graphics (TVCG)
- IEEE Transactions on Multimedia (TMM)

Invited Talks

- Associative Learning for Multimodal Representation under Ambiguous Pair Problems @ KHU 2023
- Weakly Paired Associative Learning for Sound and Image Representations @ ETRI 2022
- Deep Learning-based VR Sickness Assessment @ IEEE Standard Association WG 3079 2019
- Quantitative Analysis on VR Sickness Considering Content Quality Factor @ TTA Standardization PG 610 2019

Teaching

- [Lecturer] Artificial Intelligence with Deep Learning @ DTaQ 2022
- [Programming Lecturer & TA] EE474 Introduction to Multimedia @ KAIST 2018, 2019, 2020
- [TA] EE205 Data Structures and Algorithms @ KAIST 2020
- [TA] EE636 Digital Video Processing @ KAIST 2018, 2019