Sujin Jang

Staff Researcher, Samsung Advanced Institute of Technology (SAIT)

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Resaerch Interests

My current and past research work broadly involve machine learning, human-computer interaction, visual analytics, and robotics. More recently, I am primarily interested in self-supervised learning, domain generalization, and cross-modal representation learning for computer vision tasks in the field of autonomous driving.

Work Experience

Samsung Advanced Institute of Technology (SAIT) *Suwon, South Korea*

Staff Researcher *Jun 2020 - Present*

- Machine/Deep Learning for Visual Perception; Autonomous Driving; ADAS

S.LSI, Samsung Electronics Co. *Hwaseong, South Korea*

Staff Engineer *Jan 2019 - Jun 2020*

- Machine/Deep Learning for Visual Perception; Autonomous Driving; ADAS

Motorola Mobility LLC. *Chicago, IL, USA*

Machine Learning Staff Researcher *Jun 2017 - Dec 2018*

- Machine/Deep learning; Computer vision; Augmented Reality(AR); Human activity analyses; Smart mobile/health devices

Education

Purdue University *West Lafayette, IN, USA*

Ph.D., in Mechanical Engineering *May 2017*

- Specialization: Human-Computer Interaction, Visual Analytics, Machine Learning
- Thesis: Methods for Analyzing Natural Patterns and Physical Ergonomics of Human Gestures in Mid-Air Interaction
- Committee members: Karthik Ramani, Niklas Elmqvist, David Ebert, Alexander Quinn, and Jitesh Panchal

University of Florida *Gainesville, FL, USA*

M.S., in Mechanical Engineering *Aug 2012*

- Specialization: Vision-based nonlinear estimation/control, Robotics, Machine Learning
- Thesis: Experimental Demonstration of Structure Estimation of Moving Objects Using Unknown Input Observers
- Committee members: Carl D. Crane III, Warren E. Dixon, and Prabir Barooah

Kookmin University *Seoul, South Korea*

B.S., in Mechanical and Automotive Engineering *Aug 2010*

- Research intern at Unmanned Vehicle Lab.
- Advisor: Jungha Kim

Publications

Journal Articles

J.2 **S. Jang**⋆, A. Villanueva⋆, W. Stüerzlinger, S. Ambike, K. Ramani, *"Advanced Modeling Method for Quantifying Cumulative Subjective Fatigue in Mid-Air Interaction"*, International Journal of Human-Computer Studies (IJHCS), Vol 169, Jan 2023 (⋆: equal contributions)

J.1 **S. Jang**, N. Elmqvist, K. Ramani, *"MotionFlow: Visual Abstraction and Aggregation of Sequential Patterns in Human Motion Tracking Data"*, IEEE Transaction on Visualization and Computer Graphics (TVCG), vol 22. Jan 31, 2016 / IEEE VAST 2015 (22% acceptance rate).

Conference Proceedings (peer-reviewed)

C.6 **S. Jang**, J. Na, D. Oh, *"DaDA: Distortion-aware Domain Adaptation for Unsupervised Semantic Segmentation"*, Advances in Neural Information Processing Systems (NeurIPS, Oral, 184/2665 ∼ 6.9%), 2022

C.5 **S. Jang**, W. Stuerzlinger, S. Ambike, K. Ramani, *"Modeling Cumulative Arm Fatigue in Mid-Air Interaction based on Perceived Exertion and Kinetics of Arm Motion"*, In Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI), 2017 (25% acc. rate)

C.4 C. Choi, A. Sinha, J. H. Choi, **S. Jang**, K. Ramani, *"A Collaborative Filtering Approach to Real-Time Hand Pose Estimation"*, In Proceedings of the IEEE Interactional Conference on Computer Vision (ICCV), 2015 (30% acceptance rate)

C.3 **S. Jang**, N. Elmqvist, K. Ramani, *"GestureAnalyzer: Visual Analytics for Pattern Analysis of Mid-Air Hand Gesture"*, In Proceedings of the ACM Symposium on Spatial User Interaction (SUI), 2014 (29% acceptance rate)

C.2 S. Gupta, **S. Jang**, K. Ramani, *"PuppetX: A Framework for Gestural Interactions With User Constructed Playthings"*, In Proceedings of the ACM Conference on Advanced Visual Interfaces (AVI), 2014 (28% acceptance rate)

C.1 **S. Jang**, A. P. Dani, C. D. Crane, W. E. Dixon, *"Experimental Results for Moving Object Structure Estimation using an Unknown Input Observer Approach"*, In Proceedings of the ASME Conference on Dynamic Systems and Control (DSCC, Best Paper in Session Award), 2012

Patens

P.2 N. A. Madhusudhana, V. K. Tyagi, N. Dabhi, H. Zhao, **S. Jang**, *"Pressure sensing device interface representation"*, US Patent 11,320,984, 2022

P.1 M. Qian, **S. Jang**, J. W. Nicholson, S. Wang, *"Modifying an image based on identifying a feature"*, US Patent 11,023,769, 2021

Honors and Awards

A.2 **Magoon Excellence in Teaching Award**, College of Engineering, Purdue University, West Lafayette, IN, 2015

A.1 **Best Paper in Session Award**, ASME Dynamic Systems and Control Conference, Fort Lauderdale, FL, 2013

Teaching Experience

School of Mechanical Engineering, Purdue University *West Lafayette, IN, USA*

Graduate Teaching Assistant *Aug. 2013–May. 2016*

ME 444: Computer-aided design and rapid prototyping

- Course goals: generating and communicating design ideas, effective use of CAD tools for product design, action toy design
- Instructed undergraduate students during the lab sessions and guided them to complete toy design projects

Media Coverage

M.5 **Health Hazards: Beware of 'gorilla arm syndrome**, DECCAN CHRONICLE, June 23rd, 2017 (Article link)

M.4 **Arm and muscle fatigue accumulates during prolonged use of mid-air computer interfaces say Purdue University researchers**, DATAQUEST, June 13th, 2017 (Article link)

M.3 **Researchers Study Gorilla Arm Fatigue in VR Gaming**, VR Times, May 9th, 2017 (Article link)

M.2 **Study researches 'gorilla arm' fatigue in mid-air computer usage**, Physics.org, May 9th, 2017 (Article link)

M.1 **Do YOU suffer from 'gorilla arm'? Experts warn virtual reality controllers are leading to new medical problems**, DailyMail, May 9th, 2017 (Article link)

Scientific Community Service

- **Reviewer**, ACM Conference on Human Factors in Computing Systems [CHI], 2016–2021
- **Reviewer**, ACM Symposium on User Interface Software and Technology [UIST], 2018
- **Reviewer**, ACM International Conference on Mobile Human-Computer Interaction [MobileCHI], 2019
- **Reviewer**, ACM Conference on Computer Supported Collaborative Work [CSCW], 2016–2019
- **Reviewer**, ACM Conference on Designing Interactive Systems [DIS], 2016–2017
- **Reviewer**, ACM Conference on Tangible, Embedded, and Embodied Interaction [TEI], 2017
- **Reviewer**, ACM Conference on Interaction Design and Children [IDC], 2017
- **Reviewer**, IEEE International Symposium on Mixed and Augmented Reality [ISMAR], 2021
- **Reviewer**, IEEE Conference on Virtual Reality [VR], 2018–2019
- **Reviewer**, IEEE Symposium on 3D User Interfaces [3DUI], 2016
- **Reviewer**, IEEE Transaction on Visualization and Computer Graphics [TVCG], 2017
- **Reviewer**, IEEE Conference on Information Visualization [InfoVis], 2015
- **Reviewer**, IEEE Conference on Visual Analytics Science and Technology [VAST], 2016–2020
- **Reviewer**, EG/VGTC Conference on Data Visualization [EuroVis], 2016
- **Student Volunteer**, IEEE VIS, 2015

References

Available upon request