Jaeheung Surh

Contact Information

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Research Interests

- 3D Computer Vision
- Image Processing
- Deep Learning

Work Experience

eXtended Reality (XR), Bucketplace — Seoul, Korea

Research Engineer — Aug 2022 – Present

- Developed computer vision solutions for 3D panoramic reconstruction
- Developed deep learning models and CUDA accelerated algorithms for 3D Gaussian Splatting
- Developed 3D interior space scanning application based on Unity 3D AR

Clova AI Research (OCR), NAVER Corp — Seongnam, Korea

Research Engineer — March 2019 – July 2022

- Developed computer vision and image processing algorithms for OCR solutions
- Developed deep learning models for OCR solutions
- Developed deep learning models and image processing algorithms for table recognition and processing

Korea Institute of Science and Technology (KIST), Center of Human-centered Interaction for Coexistence (CHIC) — Seoul, Korea

Researcher — April 2017 – March 2019

- Developed a high volume data transfer network framework for interactive and cooperative experience in networked VR
- Developed computer vision and deep learning solutions to aid in VR QoE
- Developed a synchronized network playout framework for concurrent a human-centric interactive platform

Research Experience

National Core Research Center (NCRC) — Daejeon, Korea

Researcher, Personal Plug and Play DigiCar Center — Aug 2015 – Feb 2017

- Researched new camera systems for future vehicles
- Researched new algorithms for 3D depth estimation

Education

KAIST — Daejeon, Korea

M.S., Electrical Engineering — March 2015 – Feb 2017

- Thesis: “Fast and Robust Depth from Focus using Ring Difference Filter”
- Advisor: Prof. In So Kweon
- Area of Study: Computer Vision

KAIST — Daejeon, Korea

B.S., Electrical and Electronic Engineering — Sept 2011 – Feb 2015

- Thesis: “Multi-Threading for Accelerated Belief Propagation on Bipartite Graphs”
- Emphasis on computer science and network programming
- Early graduation (1 semester)

International Journals

1. Hae-Gon Jeon*, **Jaeheung Surh***, Sunghoon Im, and In So Kweon, "Ring Difference Filter for Fast and Noise Robust Depth from Focus," *IEEE Transactions on Image Processing* (**TIP**), August 2019.

International Conferences

1. Kim Yu-Ji, Hyunwoo Ha, Kim Youwang, Jaeheung Surh, Hyowon Ha, Tae-Hyun Oh, "MeTTA: Single-View to 3D Textured Mesh Reconstruction with Test-Time Adaptation," *In Proc. of British Machine Vision Conference* (**BMVC**) **[Best Poster Award]**, August 2024.
2. Youngmin Baek, Daehyun Nam, Jaeheung Surh, Seung Shin, Seonghyeon Kim, "TRACE: Table Reconstruction Aligned to Corner and Edges," *In Proc. of International Conference on Document Analysis and Recognition* (**ICDAR**), August 2023.
3. Seonghyeon Kim, Seung Shin, Yoonsik Kim, Han-Cheol Cho, Taeho Kil, **Jaeheung Surh**, Seunghyun Park, Bado Lee, Youngmin Baek, "DEER: Detection-agnostic End-to-End Recognizer for Scene Text Spotting," *arXiv* , March 2022.
4. Joongjae Lee, **Jaeheung Surh**, Wooseong Choi, Bumjae You, "Immersive Virtual-Reality-Based Streaming Distance Education System for Solar Dynamics Observatory: A Case Study," *Applied Sciences* , September 2021.
5. Seunghyun Park, Seung Shin, Bado Lee, Junyeop Lee, **Jaeheung Surh**, Minjoon Seo, Hwalsuk Lee, "CORD: A Consolidated Receipt Dataset for Post-OCR Parsing," *Document Intelligence Workshop at Neural Information Processing Systems* (**NeurIPS**), December 2019.
6. Tae-Young Lee, Eunmi Lee, **Jaeheung Surh**, Joong-Jae Lee, Bum-Jae You, "Balanced Clock Skew Compensation for Immersive Networked Interactions Based on Inter Media Synchronization Level," *In Proc. of the IEEE Computer science and Electronic Engineering Conference* (**CEEC**) **[Oral Presentor]**, September 2018.
7. **Jaeheung Surh**, Hae-Gon Jeon, Hyowon Ha, Sunghoon Im and In So Kweon, "Noise Robust Depth from Focus using a Ring Difference Filter," *In Proc. of the IEEE Conference on Computer Vision and Pattern Recognition* (**CVPR** – 29% acceptance rate) **[Spotlight Presentation – 5% of submissions]**, July 2017.
8. Bokyung Lee, Jiwoo Hong, **Jaeheung Surh** and Daniel Saakes, "Ori-mandu: Korean Dumpling into Whatever Shape You Want," *In Proc. of the ACM SIGCHI Conference on Designing Interactive Systems* (**DIS** – 22% acceptance rate) **[Pictorial]**, June 2017.
9. Bokyung Lee, Jiwoo Hong, **Jaeheung Surh** and Daniel Saakes, "Ori-mandu: Korean Dumpling into Whatever Shape You Want," *In Proc. of the ACM CHI Conference Extended Abstracts on Human Factors in Computing Systems* (**CHI** – 25% acceptance rate) **[Video Showcase]**, May 2017.

Other Publications

1. **Jaeheung Surh**, Hae-Gon Jeon, Hyowon Ha, Sunghoon Im and In So Kweon, "Fast Depth from Defocus with Your Mobile Phone for Synthetic Defocus", *In Proc. of the 28th Workshop on Image Processing and Image Understanding* (**IPIU**), Feb 2016.

Invited Talks

1. "Fast and Noise Robust Depth from Focus using Ring Difference Filter with Your Mobile Phone," (**Naver D**^{2}), YouTube video: https://bit.ly/RDFNaver, Sept 2017.

PATENTS

1. Table generating method and system, 2024, KR102655430B1
2. Method and system for generating table, and method and system for recognizing table, 2022, WO2022182111A1
3. Table creation method and system, and method and system for correcting image including table, 2022, WO2022182104A1
4. Method and system for detecting character string by using high-dimensional polynomial regression, 2022, WO2022164031A1
5. Method and system for recognizing tables, 2022, KR20220133434A
6. Image correction method and system with table, 2022, KR20220132213A
7. Table generating method and system, 2022, KR20220120222A
8. Table generating method and system, 2022, KR20220120221A
9. Apparatus and method for extracting information of interest based on document image, 2021, KR102280240B1
10. Method and apparatus for operating dynamic network service based on latency, 2020, KR102179547B1
11. Dynamic network configuration and server extension system and method, 2020, KR102144092B1
12. Method and apparatus for estimating depth using ring difference filter, 2018, KR101905142B1

SKILLS

- Languages (by fluency): English, Korean
- Programming Languages (by fluency): Python, C/C++, CUDA, C#, MATLAB, LaTeX, JAVA
- Experience with PyTorch, Tensorflow, and MXNet
- Experience with Linux and socket programming
- Experience with Unity (C#) and VR development