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 lightweight deep learning models

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. 테이블 생성 방법 및 시스템, 2024, KR20220120222A
2. 테이블 생성 방법 및 시스템, 2024, KR102655430B1
3. 테이블 생성 방법 및 시스템, 그리고 테이블 인식 방법 및 시스템, 2022, WO2022182111A1
4. 테이블 생성 방법 및 시스템, 그리고 테이블이 포함된 이미지 보정 방법 및 시스템, 2022, WO2022182104A1
5. 고차원 다항식 회귀를 이용한 문자열 검출 방법 및 시스템, 2022, WO2022164031A1
6. APPARATUS AND METHOD FOR EXTRACTING INFORMATION OF INTEREST BASED ON DOCUMENT IMAGE, 2021, https://doi.org/10.8080/1020190104577
7. METHOD AND APPARATUS FOR OPERATING DYNAMIC NETWORK SERVICE BASED ON LATENCY, 2020, https://doi.org/10.8080/1020190049152
8. 지연시간 기반의 동적 네트워크 서비스 운용 방법 및 장치, 2020, KR102179547B1
9. DYNAMIC NETWORK CONFIGURATION AND SERVER EXTENSION SYSTEM AND METHOD, 2020, https://doi.org/10.8080/1020190049151
10. METHOD AND APPARATUS FOR ESTIMATING DEPTH USING RING DIFFERENCE FILTER, 2018, https://doi.org/10.8080/1020170091717
11. 고리형 필터를 이용한 깊이 추정 방법 및 장치, 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
- Computer hardware enthusiast and audiophile