

Curriculum Vitæ

Soonbin Lee

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RESEARCH INTERESTS

Video Coding, Data Compression, Neural Radiance Fields
MPEG Standardization, MPEG Immersive Video (MIV), Streaming System

EDUCATION

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|---|---|
| Technische Universität Berlin <i>PhD of Computer Engineering (Doctoral Candidate with Fraunhofer Institute)</i> | Berlin, Germany Feb. 2023 – |
| Sungkyunkwan University (SKKU) <i>Master of Computer Science Education (advisor: Eun-Seok Ryu)</i> | Seoul, South Korea Mar. 2020 – Feb 2022 |
| Gachon University <i>Bachelor of Computer Engineering (Minor: Financial Mathematics)</i> | Seongnam, South Korea Mar. 2014 – Feb 2020 |

EXPERIENCE

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| Fraunhofer Heinrich Hertz Institute (HHI) <i>Research Associate, Multimedia Communications Group [webpage]</i> | Berlin, Germany Feb. 2023 – |
| Sungkyunkwan University (SKKU) <i>Student Researcher, Multimedia Computing Systems Laboratory [webpage]</i> | Seoul, South Korea Feb. 2022 – Feb. 2023 |
| Republic of Korea Air Force (ROKAF) <i>Military Service, A-756, 15th Special Mission Wing</i> | Seoul, South Korea Sep. 2015 – Sep. 2017 |

PUBLICATIONS

⟨ Conference ⟩

- [1] Jong-Beom Jeong, Jun-Hyeong Park, **Soonbin Lee** and Eun-Seok Ryu, “Fine-grained Single-layer Tiling for Viewport-Adaptive 360-degree Video Streaming” *IEEE Visual Communications and Image Processing (VCIP’23)*.
- [2] **Soonbin Lee**, Dongmin Jang, Jong-Beom Jeong and Eun-Seok Ryu, “Implementing Partial Atlas Selector for Viewport-dependent MPEG Immersive Video Streaming” *ACM Workshop on Network and Operating Systems Support for Digital Audio and Video (NOSSDAV’23)*.
- [3] Jong-Beom Jeong, **Soonbin Lee** and Eun-Seok Ryu, “Rethinking Fatigue-Aware 6DoF Video Streaming: Focusing on MPEG Immersive Video” *IEEE International Conference on Information Networking (ICOIN’22)*.
- [4] **Soonbin Lee**, Jong-Beom Jeong, Inae Kim and Eun-Seok Ryu, “Efficient Group-Based Packing Strategy for 6DoF Immersive Video Streaming” *IEEE International Conference on Information Networking (ICOIN’22)*.
- [5] **Soonbin Lee**, Dongmin Jang, Jong-Beom Jeong and Eun-Seok Ryu, “Atlas Level Rate Distortion Optimization for 6DoF Immersive Video Compression” *ACM Workshop on Network and Operating Systems Support for Digital Audio and Video (NOSSDAV’22)*.
- [6] Jong-Beom Jeong, **Soonbin Lee**, Inae Kim and Eun-Seok Ryu, “Implementing Viewport Tile Extractor for Viewport-Adaptive 360-Degree Video Tiled Streaming” *IEEE International Conference on Information Networking (ICOIN’21)*.
- [7] **Soonbin Lee**, Jong-Beom Jeong, Inae Kim and Eun-Seok Ryu, “Learned Image Compression with Frequency Domain Loss” *IEEE International Conference on Information Networking (ICOIN’21)*.
- [8] Jong-Beom Jeong, **Soonbin Lee** and Eun-Seok Ryu, “DWS-BEAM: Decoder-Wise Subpicture Bitstream Extracting and Merging for MPEG Immersive Video” *IEEE Visual Communications and Image Processing (VCIP’21)*.
- [9] Jong-Beom Jeong, **Soonbin Lee**, Ill-Woong Ryu, Tuan Thanh Le and Eun-Seok Ryu, “Towards Viewport-dependent 6DoF 360 Video Tiled Streaming for Virtual Reality Systems” *ACM Multimedia (MM’20)*.

[10] **Soonbin Lee**, Dongmin Jang, Jong-Beom Jeong and Eun-Seok Ryu, “Motion-constrained Tile Set based 360-Degree Video Streaming Using Saliency Prediction” *ACM Workshop on Network and Operating Systems Support for Digital Audio and Video (NOSSDAV’19)*.

⟨ Journal ⟩

[1] **Soonbin Lee**, Jong-Beom Jeong and Eun-Seok Ryu, “Entropy-constrained Implicit Neural Representations for Deep Image Compression” *IEEE Signal Processing Letters (SPL)*, Vol. 30, pp. 663-667, May. 2023.

[2] **Soonbin Lee**, Jong-Beom Jeong and Eun-Seok Ryu, “Group-based Adaptive Rendering System for 6DoF Immersive Video Streaming” *IEEE Access*, Vol. 10, pp. 102691-102700, Sep. 2022.

[3] Jong-Beom Jeong, **Soonbin Lee** and Eun-Seok Ryu, “VVC Subpicture-based Frame Packing for MPEG Immersive Video” *IEEE Access*, Vol. 10, pp. 103781-103792, Sep. 2022.

[4] Jong-Beom Jeong, **Soonbin Lee** and Eun-Seok Ryu, “Towards 3DoF+ 360 Video Streaming System for Immersive Media” *IEEE Access*, Vol. 7, pp. 136399-136408, Sep. 2019.

MPEG CONTRIBUTIONS & PATENTS

MPEG Standardization Contributions

- [MIV] On Delta QP for Additional View Atlases, document MPEG2022/m60377
- [MIV] Geometry Packing Implementation in TMIV for Frame Packed Video, document MPEG2022/m59442
- [MIV] Joint bit allocation for MIV with rate-distortion optimization, document MPEG2021/m58150
- [MIV] Extraction and Merging on Frame Packed Video, document MPEG2021/m56591
- [MIV] Basic View Packing with Screen Content Coding (SCC), document MPEG2021/m55966
- [MPEG-I Visual] EE Results on Dense Light Field Video Compression using VVC, document MPEG2021/m55965
- [MPEG-I Visual] Report on Asymmetric Quantization on MIV, document MPEG2020/m55014
- [MPEG-I Visual] Report on Dense Light Field Compression in VVC, document MPEG2020/m55013
- On MCTS based tile extractor implementation, document MPEG2020/m53911
- Group Tiling in TMIV, document MPEG2019/m51639
- CE1: Viewport Tile Selector in TMIV for Viewport-dependent Rendering, document MPEG2019/m51638
- CE3: Viewport-dependent Patch Grouping Using HEVC Tiles, document MPEG2019/m50818

US Patents

- US 2023/0334706A1
- US 2022/0343545A1
- US 2022/0256131A1
- US 2022/0217314A1
- US 2022/0116578A1
- US 18/354,983
- US 18/338,613
- US 18/115,248

KR Patents

- KR 10-2500199
- KR 10-2484999
- KR 10-2412410
- KR 10-2356037
- KR 10-2209192
- KR 10-2023-0142819
- KR 10-2023-0077401
- KR 10-2023-0003994
- KR 10-2022-0170721
- KR 10-2022-0076272
- KR 10-2022-0014916
- KR 10-2021-0150076

AWARDS & HONORS

MCSL Outstanding Research Award, 2022.

SIGMM Student Travel Grants at ACM MMSys, 2022.

SKKU Graduate Student Research Paper Award, 2022.

IEEE Seoul Section Student Paper Contest Bronze Paper Award, 2021.

Gachon President Award for Research Excellence, 2019.