Jin Heo

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Education

Doctor of Philosophy |Aug 2019 - Present | Georgia Institute of Technology, Atlanta, GA, US

- Major: Computer Science
- Related coursework: Advanced Computer Vision, Advanced Operating Systems, System for Machine Learning, Distributed Computing, Video Game Design, Intro to Graduate Algorithms, Computer Networks, Ubiquitous Computing, Data Compression and Modeling
- Overall GPA: 4.0/4.0

Bachelor of Science |Mar 2016 - Aug 2018 | Ajou University, Suwon, South Korea

- Major: Computer Engineering
- Related coursework: Computer Program Design, Data Structure, Algorithm, Database, Operating Systems, System Programming, Computer Communication, Computer Networks, Digital Circuits, Computer Architecture, Design Analysis and Software Design, Computer Vision, Artificial Intelligence, Software Capstone Design
- Overall GPA 4.4/4.5, Valedictorian (1/213)

Associate of Science | Mar 2015 - Feb 2016 | National Institute for Lifelong Education, Seoul, South Korea

Attended for Freshmen | Mar 2011 - Dec 2014 | ChungKang College of Cultural Industries, Icheon, South Korea

Experience

Graduate Research Assistant | Kernel Lab, Georgia Tech, GA, US | Aug 2019 - Present

- Building a flexible XR serving system for the edge – FleXR: A System for Enabling Flexibly Distributed Extended Reality [3-4]
- Conducting research on rendering optimization for cloud gaming platforms with application-quality awareness for higher scalability and resource efficiency

Graduate Researcher| Ericsson Research, CA, US | Mar 2021 - Dec 2022

- Conducted research on LiDAR point cloud compression – FLiCR: A Fast and Lightweight LiDAR Point Cloud Compression Based on Lossy RI [1]
- Developing a method to make the remote LiDAR perception robust to lossy compression techniques [2]

Undergraduate Research Fellow | Parallel Architectures and Systems Lab, UC Irvine, CA, US | July 2017 - Jan 2018

- Developed an FPGA framework that optimizes computer vision algorithms by splitting and re-organizing the dataflow graph on Intel Arria 10 FPGA via Intel HLS tools
- Implemented and optimized modules of computer vision algorithms on OpenCV and OpenVX
- This work was published on the 26th IEEE FCCM, 2018 [5].

Undergraduate Research Assistant | Ajou Computer Communication Lab, Ajou University, Suwon, Korea | Mar 2017 - Jul 2017

- Investigated network protocols such as HIP and Mobile IPv6 for developing a continuous communication system for mobile devices
- Proposed a network protocol stack for a new communication platform for mobile devices

Undergraduate Research Fellow | CSIRO, Brisbane, Australia | Dec 2016 - Feb 2017

- Developed a radio communication system for wireless sensor networks (WSN)
- The system was implemented on TI SensorTag and Contiki OS, a tiny operating system for sensor devices.
- Applied a network flooding algorithm, Glossy, and optimized Contiki kernels for synchronizing the radio transmissions across WSN

Publications & Presentations

[1] *FleXR: A System Enabling Flexibly Distributed Extended Reality*, Jin Heo, Ketan Bhardwaj, Ada Gavrilovska, The 14th ACM Multimedia Systems Conference (MMSys '23)

[2] *FLiCR: A Fast and Lightweight LiDAR Point Cloud Compression Based on Lossy RI*, **Jin Heo**, Christopher Phillips, Ada Gavrilovska, The Seventh ACM/IEEE Symposium on Edge Computing (SEC '22)

[3] *Poster: Making Edge-assisted LiDAR Perceptions Robust to Lossy Point Cloud Compression*, **Jin Heo**, Gregoire Phillips, Per-Erik Brodin, Ada Gavrilovska, The Seventh ACM/IEEE Symposium on Edge Computing (SEC '22)

[4] *Poster: Enabling Flexible Edge-assisted XR*, **Jin Heo**, Ketan Bhardwaj, Ada Gavrilovska, The Sixth ACM/IEEE Symposium on Edge Computing (SEC '21) -- ***Best Poster Award***

[5] *Demo: Towards End-to-End Benchmarking For Multi-Party AR*, **Jin Heo**, Jeffrey Zhang, Sarita Adve, Ada Gavrilovska, The 2020 Applications Driving Architectures (ADA) Center Symposium, 2020.11

[6] *Acceleration framework for fpga implementation of openvx graph pipelines*, Taheri, Sajjad, **Jin Heo**, Payman Behnam, Jeffrey Chen, Alexander Veidenbaum, and Alexandru Nicolau, IEEE 26th Annual International Symposium on Field-Programmable Custom Computing Machines (FCCM '18).

Technical Skills & Open Source Contributions

- Programming Language: C/C++, C#, Java, Python, and Shell Script
- Software Platforms and Tools: OpenGL, OpenCV, OpenVX, Pytorch, Tensorflow, Docker, gRPC, ZMQ, GStreamer, RaftLib, FFmpeg, Makefile, CMake, Meson, Unity3D, Unreal Engine
- Project Management and Documentation: Git, Agile Method, Test-Driven Development, Doxygen, Markdown
- Open Source Contributions
  - RaftLib: Resolving the issue of the pipeline scheduler for resource efficiency
  - uvgRTP: improving the build system for Linux installation with pkg-config