
EDUCATION

- **Georgia Institute of Technology** Atlanta, GA
Doctor of Philosophy in Computer Science; GPA: 4.0 Aug. 2019 – Present
- **Ajou University** Suwon, South Korea
Bachelor of Science in Computer Engineering; GPA: 4.4/4.5, Valedictorian (1/213) Mar. 2016 – Aug. 2018
- **National Institute for Lifelong Education** Seoul, South Korea
Associate of Science in Computer Engineering Mar. 2015 – Feb. 2016
- **ChungKang College of Cultural Industries** Icheon, South Korea
Attended for Freshmen Mar. 2011 – Dec. 2014

PUBLICATIONS & TALKS

- *FleXR: A System Enabling Flexibly Distributed Extended Reality*, **Jin Heo**, Ketan Bhardwaj, Ada Gavrilovska, 14th ACM MMSys (**To appear**)
- *FLiCR: A Fast and Lightweight LiDAR Point Cloud Compression Based on Lossy RI*, **Jin Heo**, Christopher Phillips, Ada Gavrilovska, 7th ACM/IEEE SEC [3]
- *Poster: Making Edge-assisted LiDAR Perceptions Robust to Lossy Point Cloud Compression*, **Jin Heo**, Gregoire Phillips, Per-Erik Brodin, Ada Gavrilovska, 7th ACM/IEEE SEC [4]
- *Poster: Enabling Flexible Edge-assisted XR*, **Jin Heo**, Ketan Bhardwaj, Ada Gavrilovska, 6th ACM/IEEE SEC – **Best Poster Award** [1]
- *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
- *Acceleration Framework for FPGA Implementation of OpenVX Graph Pipelines*, Sajjad Taheri, **Jin Heo**, Payman Behnam, Jeffrey Chen, Alexander Veidenbaum, and Alexandru Nicolau, 26th IEEE FCCM [5]

EXPERIENCES & PROJECTS

- **Kernel Lab, Georgia Tech** Atlanta, GA, USA
Graduate Research Assistant Aug. 2019 - Present
 - **Adaptive rendering optimization for scalable cloud gaming:** Stimpack is a system that enables adaptive rendering optimization for cloud gaming service. By fully utilizing the characteristics of cloud gaming, Stimpack effectively improves the number of users served by each server node.
 - **Enabling flexibly distributed eXtended Reality (XR):** FleXR [1, 2] is a system that enables flexibly distributed XR. Based on the concept of stream processing, FleXR provides a framework that makes its pipeline kernels deployable for different distributed environments without any code changes. With FleXR, XR pipelines in various distributed topologies can be flexibly created at runtime, enabling an efficient edge assistance in various distributed environments.
- **Ericsson Research** Santa Clara, CA, USA
Graduate Researcher (Remote Internship) Mar. 2021 - Dec. 2022
 - **Lightweight and low-latency LiDAR point cloud compression:** FLiCR [3] is a fast and lightweight LiDAR point cloud compression method. By using the range image as an intermediate representation of LiDAR point clouds, FLiCR aggressively utilizes down-sampling and quantization together to improve the compression ratio of the downstream compression algorithm, and to reduce the latency and energy usage. It is lightweight to run on commodity mobile devices and fast to reduce the discrepancies between the perception results and real-world objects, caused by the end-to-end latency of the offloaded LiDAR perception.
 - **Making remote LiDAR perceptions robust to lossy compression:** This work develops the method to improve the LiDAR perception performance on the encoded-decoded point clouds with lossy compression. By interpolating points at the intermediate representation of LiDAR point clouds, the perception performance degradation caused by the lossy compression is mitigated [4].

- **Parallel Architectures and Systems Lab, UC Irvine**

Irvine, CA, USA

Undergraduate Research Assistant (UROP)

Jul. 2017 - Jan. 2018

- **FPGA acceleration for OpenVX graph pipeline:** This work is to develop a framework of FPGA acceleration for pipelined operations [5]. The proposed framework splits and re-organizes the dataflow graph of an OpenVX pipeline for optimizing its execution. Our framework is implemented on the Intel high-level synthesis (HLS) tool with Arria 10 FPGA.

- **Computer Communication Lab, Ajou University**

Suwon, South Korea

Undergraduate Research Assistant (UROP)

Mar. 2017 - Jul. 2017

- **Network protocol investigation for continuous mobile communication:** For enabling continuous session-based communication of mobile users at the application level, the network protocol stack is investigated. Based on Host Identity Protocol (HIP) and Mobile IPv6, the network protocol stack is proposed.

- **Commonwealth Scientific and Industrial Research Organisation**

Brisbane, Australia

Undergraduate Research Assistant (UROP)

Dec. 2016 - Feb. 2017

- **A radio communication method for wireless sensor networks (WSN):** This work is to develop an efficient communication method among commodity sensor devices of limited batteries. The proposed communication method is implemented on TI SensorTag and Contiki OS by using a network flooding algorithm that synchronizes the radio transmissions across WSN.

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
- **RaftLib:** Contributed to resolving the issue of the pipeline scheduler for resource efficiency
- **uvgRTP:** Contributed to improving the build system for Linux installation with pkg-config

REFERENCES

- [1] Jin Heo, Ketan Bhardwaj, and Ada Gavrilovska. Poster: Enabling flexible edge-assisted xr. In *2021 IEEE/ACM Symposium on Edge Computing (SEC)*, pages 465–467. IEEE, 2021.
- [2] Jin Heo, Ketan Bhardwaj, and Ada Gavrilovska. Flexr: A system enabling flexibly distributed extended reality. In *Proceedings of the 14th ACM Multimedia Systems Conference*. ACM, 2023.
- [3] Jin Heo, Christopher Phillips, and Ada Gavrilovska. Flier: A fast and lightweight lidar point cloud compression based on lossy ri. In *2022 IEEE/ACM 7th Symposium on Edge Computing (SEC)*, pages 54–67. IEEE, 2022.
- [4] Jin Heo, Gregoire Phillips, Per-Erik Brodin, and Ada Gavrilovska. Poster: Making edge-assisted lidar perceptions robust to lossy point cloud compression. In *2022 IEEE/ACM 7th Symposium on Edge Computing (SEC)*, pages 293–295. IEEE, 2022.
- [5] Sajjad Taheri, Jin Heo, Payman Behnam, Jeffrey Chen, Alexander Veidenbaum, and Alexandru Nicolau. Acceleration framework for fpga implementation of openvx graph pipelines. In *2018 IEEE 26th Annual International Symposium on Field-Programmable Custom Computing Machines (FCCM)*, pages 227–227. IEEE, 2018.