Jaehong Kim

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Research Interest

AI for systems, **AI for video streaming**, **Immersive video**, **Systems for large-scale AI**, **Networked systems**

Education

Korea Advanced Institute of Science and Technology (KAIST) Feb 2020 - Present
Ph.D. Candidate in Electrical Engineering (Advisor: Dongsu Han)

Korea Advanced Institute of Science and Technology (KAIST) Aug 2018 - Feb 2020
M.S. in Electrical Engineering (Advisor: Dongsu Han)

Korea Advanced Institute of Science and Technology (KAIST) Feb 2014 - Aug 2018
B.S. in Electrical Engineering (Cum Laude)

Publications

(C1) **FlexPass: A Case for Flexible Credit-based Transport for Datacenter Networks**
Hwijoon Lim, Jaehong Kim, Inho Cho, Keon Jang, Wei Bai, and Dongsu Han
ACM EuroSys 2023 (Acceptance Rate 26/184 (Fall): 14.1%)

(C2) **OutRAN: Co-optimizing for Flow Completion Time in Radio Access Network**
Jaehong Kim, Yunheon Lee, Hwijoon Lim, Youngmok Jung, Song Min Kim, and Dongsu Han
ACM CoNEXT 2022 (Acceptance Rate 28/151: 18.5%, **Best paper award nominee**)

(C3) **NeuroScaler: Neural Video Enhancement at Scale**
Hyunho Yeo, Hwijoon Lim, Jaehong Kim, Youngmok Jung, Juncheol Ye, and Dongsu Han
ACM SIGCOMM 2022 (Acceptance Rate 55/281: 19.5%)

(C4) **Neural-Enhanced Live Streaming: Improving Live Video Ingest via Online Learning**
Jaehong Kim*, Youngmok Jung*, Hyunho Yeo, Juncheol Ye, and Dongsu Han
ACM SIGCOMM 2020 (Acceptance Rate 53/250: 21.2%)

(C5) **Neural Adaptive Content-aware Internet Video Delivery**
Hyunho Yeo, Youngmok Jung, Jaehong Kim, Jinwoo Shin, and Dongsu Han
USENIX OSDI 2018 (Acceptance Rate 47/257: 18.2%)

(W1) **Neural Cloud Storage: Innovative Cloud Storage Solution for Cold Video**
Jinyeong Lim, Juncheol Ye, Jaehong Kim, Hwijoon Lim, Hyunho Yeo, and Dongsu Han
ACM HotStorage 2023

Honors and Awards

29th Samsung Humantech Paper Award Silver Prize (2nd place), Communication & Networks. Samsung, Feb 2023
Google Conference Scholarship Google, Dec 2022
ACM CoNEXT Best paper award nomination & student grant NSF&ACM, Dec 2022
28th Samsung Humantech Paper Award Gold Prize (1st place), Communication & Networks. Samsung, Feb 2022
KAIST Breakthrough of the Year KAIST, 2021
Donghwa Industry Moon Daewon AI Research Scholarship KAIST, 2020

Projects

Neural-enhanced Live Volumetric Video Streaming Nov 2022 - Present
- Designing a new live streaming system for live captured volumetric video powered by DNN.

Cross-layer Optimization for 5G Radio Access Networks Sep 2020 - Sep 2022
- Designed a new transport-layer scheduling for latency-sensitive traffic in 4G/5G networks.
- Implemented the design on top of srsRAN gNodeB, which runs on USRP Software Defined Radios (SDR).
- Reduced the webpage load time of Android phones up to **34%** outperforming legacy 4G/5G MAC schedulers.

Neural-enhanced Live Video Streaming Nov 2018 - Jul 2020
- Designed a live ingest system that enhances live video quality with online-trained super-resolution DNNs.
- Implemented the client and ingest server with WebRTC, PyTorch, and ffmpeg.
- Improved quality experience for live stream viewers up to **69%** or saved streamer's bandwidth usage by **45.9%**.

Neural-enhanced Adaptive Video Streaming Mar 2017 - Oct 2018
- Designed adaptive streaming that applies neural enhancement to video utilizing client computation.
- Contributed to implementing an end-to-end system on top of MPEG DASH (dash.js) and TensorFlow as a student intern.
- Improved user quality experience by **43.08%** or saved **17.13%** of network bandwidth.

Skills

Programming languages: C/C++, Python, Javascript
Languages: Korean (native), English (fluent, IBT TOEFL 106)
AI frameworks: TensorFlow, PyTorch, TensorRT
Other skills: dash.js, ffmpeg, NS-3 simulator, srsRAN, Docker, cuda

Service and Teaching

Journal Review: IEEE/ACM transactions on networking
Teaching: Teaching assistant (5 courses, 8 semesters)