Hyunho Yeo

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Research Interest

AI/ML systems, **Video systems**, **Networked systems**

Education

Korea Advanced Institute of Science and Technology (KAIST) Feb 2017 - May 2023
Ph.D. in Electrical Engineering (Advisor: Dongsu Han)
Dissertation title: Enabling Neural-enhanced Video Streaming

Korea Advanced Institute of Science and Technology (KAIST) Feb 2012 - Feb 2017
B.S. in Electrical Engineering (Magna Cum Laude)

Publications

(C1) **AccelIR: Task-aware Image Compression for Accelerating Neural Restoration**
Juncheol Ye, Hyunho Yeo, Jinwoo Park, and Dongsu Han
IEEE CVPR 2023 (Acceptance Rate 2360/9155: 25.7%)

(C2) **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%)

(C3) **NEMO: Enabling Neural-enhanced Video Streaming on Commodity Mobile Devices**
Hyunho Yeo, Chan Ju Chong, Youngmok Jung, Juncheol Ye, and Dongsu Han
ACM MobiCom 2020 (Acceptance Rate 62/384: 16.1%)

(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) **How will Deep Learning Change Internet Video Delivery?**
Hyunho Yeo, Sunghyun Do, and Dongsu Han
ACM HotNets 2017 (Acceptance Rate 28/124: 22.5%)

Awards

Google Conference Scholarship 2022
KAIST Breakthrough of the Year 2021
KAIST Global Leader Scholarship 2020
Microsoft Fellowship Asia Nomination Award 2019
KAIST EE Best Research Achievement 2018

Projects

Neural-enhanced Live Video Ingest at Scale Aug 2020 - Aug 2022
Ph.D. student, KAIST

- Designed an inference engine that delivers efficient and scalable live neural enhancement.
- Implemented the end-to-end system on top of NVIDIA TensorRT, libvpx, and gRPC (∼ **10.1K LoC**).
- Reduced computing cost by **3.0-22.3**× and improved processing throughput by **2.5-10**×.

Neural-enhanced Mobile Video Streaming Nov 2018 - Jul 2020
Ph.D. student, KAIST

- Designed an algorithm that accelerates neural enhancement using temporal redundancy across video frames.
- Implemented an end-to-end system upon Exoplayer, libvpx, and Qualcomm SNPE (∼ **9.4K LoC**).
- Improved processing throughput by **11.5**× and reduced energy consumption by **88.6%**.

Neural-enhanced Adaptive Video Streaming Mar 2017 - Oct 2018
Ph.D. student, KAIST

- Designed adaptive streaming that applies neural enhancement to video utilizing client computation.
- Implemented an end-to-end system on top of MPEG DASH (dash.js) and TensorFlow (∼ **13.6K LoC**).
- Improved user quality experience by **43.08%** or saved **17.13%** of network bandwidth.

Skills

Programming languages: C/C++, Python, JAVA
Languages: Korean (native), English (fluent)
AI frameworks: Tensorflow, Pytorch, TensorRT, SNPE

Service & Teaching

Journal Review: IEEE ToN, IEEE TPAMI, IEEE Multimedia
Mentoring: 13 undergraduate students, 6 graduate students