Hyunho Yeo (Ph.D. Candidate)

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RESEARCH INTERESTS   Networked Systems, Machine Learning Systems

EDUCATION

Korea Advanced Institute of Science and Technology (KAIST)   FEB. 2017 – FEB. 2023 (Expected)
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

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

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

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

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

5. How will Deep Learning Change Internet Video Delivery?
<u>Hyunho Yeo</u>, 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)

RESEARCH PROJECTS

Neural-enhanced Live Video Ingest at Scale ($\approx$ 10.1K LoC)   AUG. 2020 – AUG. 2022
● Designed an inference engine that delivers efficient and scalable live neural enhancement.
● Implemented the end-to-end system on top of **TensorRT** (GPU inference engine) and **libvpx** (VP9 codec).
● Reduced computing cost by **3.0-22.3$\times$** and improved processing throughput by **2.5-10$\times$**.

Neural-enhanced Mobile Video Streaming ($\approx$ 9.4K LoC)   NOV. 2018 – JUL. 2020
● Designed an algorithm that accelerates neural enhancement using temporal redundancy across video frames.
● Implemented the end-to-end system upon **Exoplayer** (Android media player) and **libvpx** (VP9 codec).
● Improved processing throughput by **11.5$\times$** and reduced energy consumption by **88.6%**.

Neural-enhanced Adaptive Video Streaming ($\approx$ 13.6K LoC)   MAR. 2017 – OCT. 2018
● Designed adaptive streaming that applies neural enhancement to video utilizing client computation.
● Implemented the end-to-end system on top of **MPEG DASH (dash.js)** and **TensorFlow**.
● Improved user quality of experience by **43.08%** or saved **17.13%** of network bandwidth.

PROFICIENT SKILLS

Programming Languages: C/C++, Python, JAVA, UNIX shell scripting
Machine Learning Frameworks: Tensorflow, Pytorch, Qualcomm SNPE, NVIDIA TensorRT
Languages: Korean (native), English (fluent)

ACADEMIC ACTIVITIES

Journal Review: IEEE ToN, IEEE TPAMI, IEEE Multimedia
Mentoring undergraduate students: Suro Kim, Seung Ho Baek, Seung Jun Lee, Tee Won Lee, Yonatan Gizachew, Chan Ju Chong, Su Min Shin, Ji Hoon Shin, Sung Whan Kim, Jae Hong Kim, Young Mok Jung, and Sunghyun Do