

Jaehong Kim

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Research Interest

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

Work Experience

Inha University

ASSISTANT PROFESSOR, DEPARTMENT OF ARTIFICIAL INTELLIGENCE

- Joint Appointment with Department of Computer Science and Information Engineering (CSE)

Incheon, S.Korea

Sep. 2025 - Present

Carnegie Mellon University

POSTDOCTORAL RESEARCHER, COMPUTER SCIENCE DEPARTMENT

- Postdoctoral Fellowship Program granted by NRF. (Advisor: Srinivasan Seshan and Anthony Rowe)

Pittsburgh, PA, USA

Sep. 2024 - Aug. 2025

Education

KAIST (Korea Advanced Institute of Science and Technology)

PH.D. IN ELECTRICAL ENGINEERING

- Thesis title: Enabling High-quality 2D and 3D Live Streaming at Ingest (Advisor: Prof. Dongsu Han)

Daejeon, S.Korea

Feb. 2020 - Aug. 2024

KAIST (Korea Advanced Institute of Science and Technology)

M.S. IN ELECTRICAL ENGINEERING

- Thesis title: Enhancing Live Video Quality at Ingest Using Online Trained DNNs (Advisor: Prof. Dongsu Han)

Daejeon, S.Korea

Sep. 2018 - Feb. 2020

KAIST (Korea Advanced Institute of Science and Technology)

B.S. IN ELECTRICAL ENGINEERING (CUM LAUDE)

Daejeon, S.Korea

Mar. 2014 - Aug. 2018

University of Maryland

EXCHANGE STUDENT PROGRAM

College Park, MD, USA

Jan. 2016 - May. 2016

Publications / Preprints

CONFERENCE PROCEEDINGS (C), JOURNAL(J), WORKSHOPS (W), PREPRINTS (P)

TOPICS

[P-4] Evaluation Framework for 4D Scenes (tentative title)

Immersive Media

Jaehong Kim, Tao Jin, Mallesham Dasari, Srinivasan Seshan, and Anthony Rowe

Under Review, 🏠 webpage

[P-3] Efficient Media Processing for AI (tentative title)

AI for Video Systems

Seyeon Lee, Juncheol Ye, Jaehong Kim, and Dongsu Han

Under Review

[P-2] Efficient Compression Method for 3D Live Streaming (tentative title)

Volumetric Video

Jaehong Kim, Joon Ha Kim, Yunheon Lee, and Dongsu Han

Under Review, 🏠 preprint, 📺 Demo

[C-6] NerVast: Compression-efficient Scaling of Implicit Neural Video Representations via Scene-based Parameter-sharing

AI for Video

Yunheon Lee, Juncheol Ye, Jaehong Kim*, and Dongsu Han*

IEEE/CVF WACV 2026, * Co-corresponding, 🏠 preprint

[C-5] FlexPass: A Case for Flexible Credit-based Transport for Datacenter Networks

Datacenter Networking

Hwijoon Lim, Jaehong Kim, Inho Cho, Keon Jang, Wei Bai, and Dongsu Han

ACM EuroSys 2023, 🏠 webpage

[C-4] OutRAN: Co-optimizing for Flow Completion Time in Radio Access Network

5G Networks

Jaehong Kim, Yunheon Lee, Hwijoon Lim, Youngmok Jung, Song Min Kim, and Dongsu Han

ACM CoNEXT 2022 (Best Paper Finalist), 🏠 webpage

[C-3] NeuroScaler: Neural Video Enhancement at Scale

AI for Live Streaming

Hyunho Yeo, Hwijoon Lim, Jaehong Kim, Youngmok Jung, Juncheol Ye, and Dongsu Han

ACM SIGCOMM 2022, 🏠 webpage

[C-2] Neural-Enhanced Live Streaming: Improving Live Video Ingest via Online Learning

AI for Live Streaming

Jaehong Kim*, Youngmok Jung*, Hyunho Yeo, Juncheol Ye, and Dongsu Han

ACM SIGCOMM 2020, * Co-first authors, 🏠 webpage

[C-1] Neural Adaptive Content-aware Internet Video Delivery	AI for Video Streaming
Hyunho Yeo, Youngmok Jung, Jaehong Kim , Jinwoo Shin, and Dongsu Han	
USENIX OSDI 2018 , 🏠 webpage , 🏠 DASH.js code	
[J-1] Efficient Disaggregated Cloud Storage for Cold Videos with Neural Enhancement	AI for Cloud Storage
Jinyeong Lim, Juncheol Ye, Jaehong Kim , Hwijoon Lim, Hyunho Yeo, Junhyeok Jang, Myoungsoo Jung, and Dongsu Han	
IEEE Micro	
[W-3] Reconstructing Reality over Time: From Drone Capture to Timelapse Gaussian Splatting	Immersive Media
Jaehong Kim , Srinivasan Seshan, and Anthony Rowe	
IEEE ISMAR 2025 (Poster)	
[W-2] Presto: Hybrid CPU-GPU Preprocessing Framework for Video-based AI Inference System	System for AI Inference
Ji Hyuk Lee, Dongsu Han, and Jaehong Kim	
ACM NetAISys 2025	
[W-1] Neural Cloud Storage: Innovative Cloud Storage Solution for Cold Video	AI for Cloud Storage
Jinyeong Lim, Juncheol Ye, Jaehong Kim , Hwijoon Lim, Hyunho Yeo, and Dongsu Han	
ACM HotStorage 2023 , 🏠 webpage	

Honors and Awards

Mar. 2025	NSF Workshop on Networking and Systems Challenges in Immersive Computing — Travel Grant	<i>NSF</i>
	Position paper accepted for the NSF Workshop with travel grant support.	
Jan. 2025	NSF NeTS Early Career Workshop with Travel Grant	<i>NSF</i>
	Selected to attend the NeTS Early Career Workshop 2025 at NSF Headquarters.	
Sep. 2024	NRF Postdoctoral Fellowship Program	<i>NRF</i>
	Selected as a principal investigator of Postdoctoral Fellowship Program (Nurturing Next-generation Researchers) in 2024 granted by the National Research Foundation of Korea (NRF) with ₩60,000,000 grant for one year.	
Feb. 2023	29th Samsung Humantech Paper Award	<i>Samsung Electronics</i>
	Awarded Silver-prize (118 out of 1972 papers), Communication & Network	
Dec. 2022	Google Conference Scholarship	<i>Google LLC</i>
	Travel grants for students giving oral presentations at top-tier CS conferences.	
Dec. 2022	ACM CoNEXT'22 Best Paper Award Nomination & ACM Student Grant	<i>NSF & ACM</i>
	Received the highest review score with five “4 Accept” ratings.	
Feb. 2022	28th Samsung Humantech Paper Award	<i>Samsung Electronics</i>
	Gold Prize (1st place), Communication & Network	
2021	KAIST Breakthrough of the Year	<i>KAIST</i>
	For the top 15 most significant research achievements.	
2020	Donghwa Industry Moon Daewon AI Research Scholarship	<i>KAIST</i>
	Awarded to a graduate student for outstanding AI research and collaborative spirit.	
2018	USENIX OSDI Student Grant	<i>USENIX</i>

Patents

INTERNATIONAL

US17265680	Live video ingest system and method	<i>KAIST</i>
US11463750B2	Method and apparatus for transmitting adaptive video in real time using content-aware neural network	<i>KAIST</i>

DOMESTIC (SOUTH KOREA)

KR10-2338986	Method for enhancing live video delivery at ingest point utilizing content-aware neural network	KAIST
KR10-2129115	Method and apparatus for transmitting adaptive video in real time using content-aware neural network	KAIST
KR10-2024-0170218	Method of encoding and decoding video including depth data	KAIST
(Filed)	AI-native Media Processing Technology based on Neural Network Representation	KAIST
KR10-2023-0164365 (Filed)	Unified Compression Method for RGB and Depth Video in Live 3D Video Streaming	KAIST
KR10-2022-0091760 (Filed)	Acceleration method for encoding selective super-resolved video	KAIST
KR10-2022-0091726 (Filed)	Acceleration and scheduling method for video super-resolution based on codec-level information	KAIST
KR10-2022-0138553 (Filed)	Practical flow scheduling algorithm designed for 4G/5G radio access network base stations for low-latency applications	Samsung Electronics & KAIST
KR10-2022-0077669 (Filed)	Method of scheduling flow and electronic device performing the method	Samsung Electronics & KAIST
KR10-2023-0181034 (Filed)	Cloud storage system for cold video with content-aware super-resolution	KAIST

Research Experience

3D Gaussian Splat Compression and Delivery

Sep. 2024 - Aug. 2025

Exploring efficient compression and Internet delivery of 3D Gaussian Splats for Immersive experience.

AI-augmented Video Delivery for Immersive Media (NRF, PI)

Sep. 2024 - Aug. 2025

Funded by the National Research Foundation of Korea (NRF) with ₩60,000,000 for one year as a postdoctoral researcher and PI.

Live Volumetric Video Streaming [P-2]

Nov. 2022 - Feb. 2024

Designed a novel RGB-D representation and delivery scheme for live 3D video streaming. It reduces depth error by **8.7×** (RMSE) and improves RGB quality by **3.18 dB** (PSNR) given the same bandwidth. Compared to Google's Draco, it reduces bandwidth usage for streaming live volumetric video by **25.3×**, while delivering **108×** denser (i.e., higher resolution) volumetric video.

Cross-layer Optimization for 5G Radio Access Networks [C-4]

Aug. 2020 - June. 2022

Developed a new transport-layer scheduling in 5G Networks that delivers better latency for latency-sensitive traffic without the QoS information. Implemented the design both on **NS-3** and on top of **srsRAN** gNodeB, which runs on **USRP** Software Defined Radios (SDR). Reduced the webpage load time up to **34%** outperforming legacy 4G/5G MAC schedulers. Funded by Samsung Electronics Modem S/W R&D Group.

Neural-enhanced Live Video Delivery [C-2, C-3]

Nov. 2018 - July. 2020

Designed a new live ingest framework that ensures high-quality live streaming to viewers by enhancing origin live video quality with online-trained super-resolution DNNs at ingest servers. Implemented the client and ingest server with **WebRTC**, **PyTorch**, and **ffmpeg**. Improved quality of experience for live stream viewers up to **69%** or saved streamer's bandwidth usage by 45.9%.

Neural-enhanced Adaptive Streaming [C-1]

Mar. 2017 - Oct. 2018

Contributed to the development of a neural adaptive content-aware video delivery system, a first application of neural enhancement in adaptive video streaming. Implemented an end-to-end system on top of **MPEG DASH (dash.js)** and **TensorFlow**. Improved the quality of user experience by **43.08%** or saved 17.13% of network bandwidth.

Mentoring Experience

Individual Study & Research

- JiHyuk Lee (B.S. CAU / Feb. 2025 - Present): Mentored research on video-based AI Inference system [W-3].
- Seyeon Lee (M.S. KAIST / Jun. 2024 - Present): Mentored research on Neural Video Pipeline [W-1].
- Junha Kim (B.S. KAIST / Jun. 2023 - Present): Mentored research on live 3D streaming [P-2]. Read his experience [🏠 here](#).
- Yunheon Lee (B.S. KAIST → Ph.D. Candidate KAIST / Jun. 2021 - Present): Mentoring research on 5G [C-4], and AI for video [P-1].
- Jinyeong Lim (M.S. KAIST): Mentored research on AI for cloud storage [W-1].
- Euijun Jeong (B.S. KAIST): Mentored research on an efficient cluster-wise training scheme for content-aware neural-enhancement.

Undergraduate Research Program (URP)

- Hyojin Choi (B.S. KAIST / Jan.2023 - Jun.2023): Mentored research on deep neural video compression.

Teaching Experience

Instructor, Inha University

- Computer Networks (AIE3009)
- Object-oriented Programming 2 (AIE1002)

(Enrollment: 41, Evaluation: TBU)
(Enrollment: 23, Evaluation: TBU)

Fall 2025
Fall 2025

Teaching Assistant, KAIST

- Advanced Computer Networking and Cloud Computing (EE618)
- Network Programming (EE324)
- SK Hynix ASK Program
- Systems and Applications of Artificial Intelligence and Machine Learning (EE793)
- Programming Structures for Electrical Engineering (EE209)

Spring 2021
Fall 2020, Fall 2021
Aug. 2020
Spring 2020
Spring & Fall 2019, Spring & Fall 2022

Presentation

Research talk at Nokia Tech AI Visual Systems Research Team

Enabling High-quality 2D and 3D Live Streaming over the Internet

[Virtual, USA](#)

April. 2025

Demo & Poster session at NSF Immercom'25 Workshop

Enabling 3D Live Streaming over the Internet

[Arlington, VA, USA](#)

April. 2025

Research talk at Qualcomm Immersive Video Research Team

Enabling High-quality 2D and 3D Live Streaming over the Internet

[Virtual, USA](#)

Feb. 2025

Computer Science & Engineering Department Seminar at UNIST

Improving the Quality of Experience (QoE) of Internet Applications

[Ulsan, S.Korea](#)

Jun. 2024

Conference talk at CoNEXT'22

Presented OutRAN: Co-optimizing for Flow Completion Time in Radio Access Network.  Demo

[Rome, Italy](#)

Dec. 2022

Conference talk at SIGCOMM'20

Presented Neural-Enhanced Live Streaming: Improving Live Video Ingest via Online Learning.

[Virtual](#)

Aug. 2020

 20-min talk ,  10-min talk

Demo & Poster session at OSDI'18

Presented demo of Neural Adaptive Content-aware Internet Video Delivery.  Demo

[Carlsbad, CA, USA](#)

Oct. 2018

Academic Service

2025 **IEEE VR**, Role: Reviewer

2025 **ACM Multimedia**, Role: Reviewer

2025 **USENIX Annual Technical Conference**, Role: Reviewer and Paper Shepherd

2023, 2024, 2025 **IEEE/ACM Transactions on Networking**, Role: Reviewer

Skills

Programming Python, C/C++, JavaScript, CUDA

AI Frameworks TensorFlow, PyTorch, TensorRT

Other Skills dash.js, ffmpeg, NS-3, srsRAN, Docker

Languages Korean (native), English (fluent, IBT TOEFL 106)

References

Available upon request.