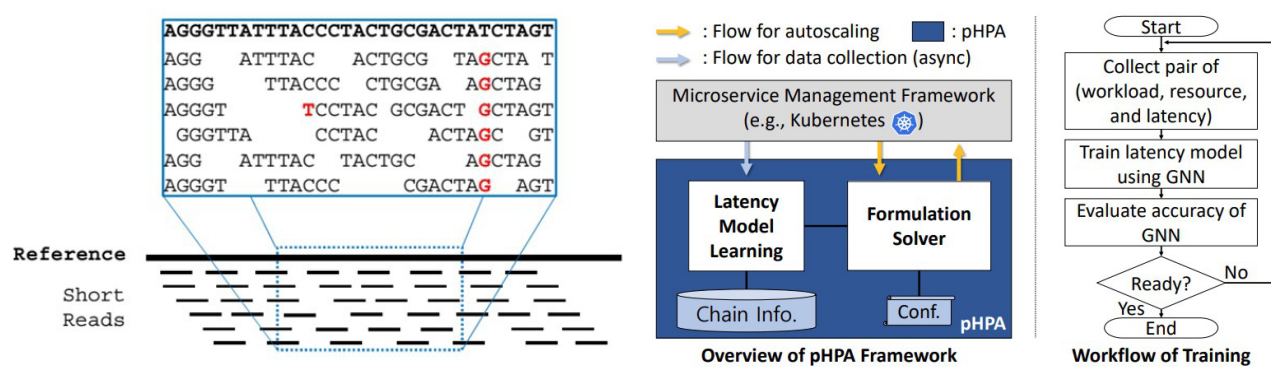


Our Research

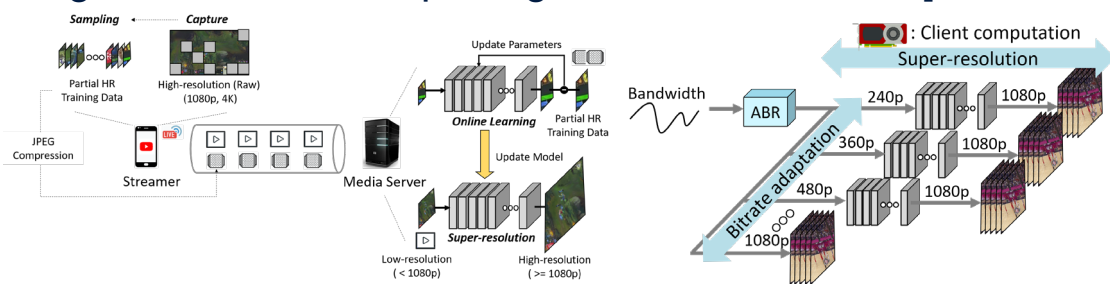
AI for Systems

- Accelerating DNA sequencing with learned index in short read alignment [Bioinformatics '22]
- Auto-scale resource allocation framework for SLO-oriented microservices (working with Toyota) [CoNEXT '21]
- Adaptive overhead control for microservices using reinforcement learning [SIGCOMM '24]
- Efficient cloud storage system for videos with neural super-resolution [IEEE MICRO]



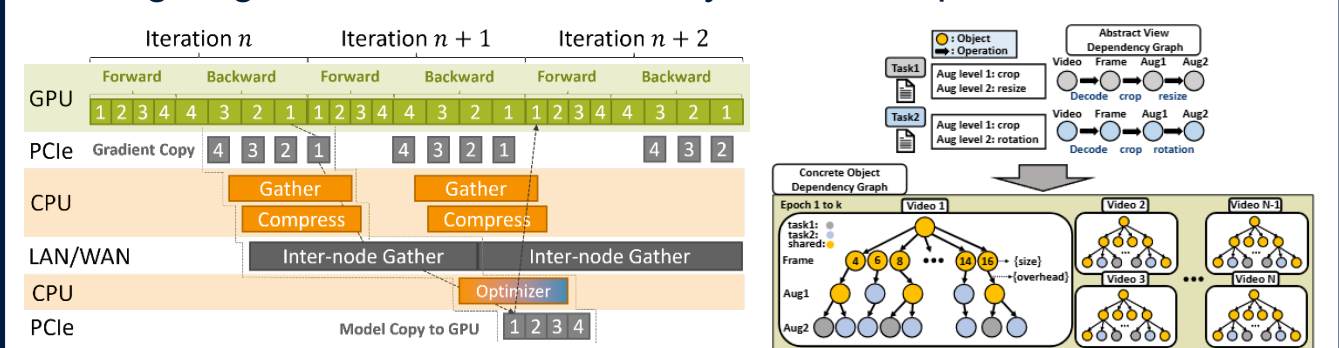
AI + Video

- HTTP adaptive streaming + neural super-resolution [USENIX OSDI '18] (First paper from KAIST in the history of OSDI)
- Live streaming + neural super-resolution [SIGCOMM '20]
- Mobile + neural super-resolution [MobiCom '20]
- Scalable neural super-resolution [SIGCOMM '22]
- Codec + neural super-resolution [CVPR '23]
- Training-free audio description generation with LLM [WACV '25]



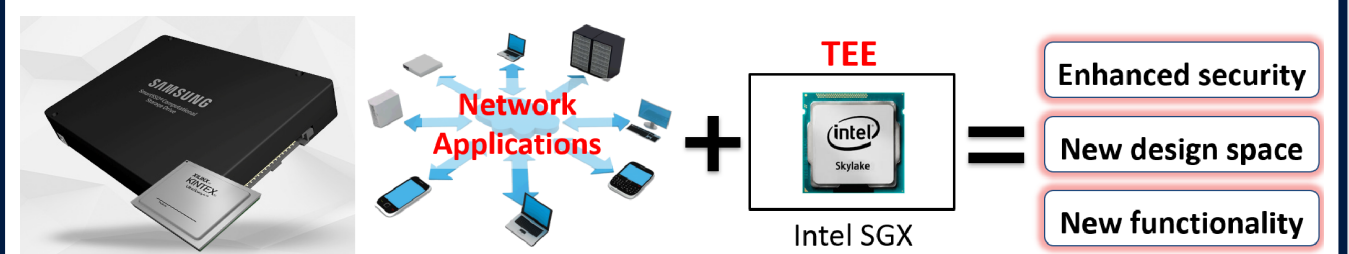
Systems for AI

- Pipeline acceleration for deep neural network training [ICML '22] Maximizes training throughput by decoupling and interleaving the computations of teacher and student networks.
- Distributed training for hybrid-cloud environments [SIGCOMM '24] Accelerates training over scarce network bandwidth by holistically adapting configuration like gradient compression and optimizers
- Efficient scaling of Mixture-of-Experts on limited GPUS [ICML '24] Accelerated training by offloading experts to host memory and overlapping communication with computation via pipelining
- Framework for accelerated video data pipelines [SOSP '25] Simplifies and accelerated video preprocessing for deep learning through high-level abstractions and system-level optimizations



Cloud Systems

- Offloading computations to Samsung computational SSD (working with Samsung)
- Practical transport protocol for datacenter [EuroSys '21, '23]
- TEE-based network system security [IEEE/ACM ToN '20, '22]



Connectivity

Alumni

Faculty



Industry



Ph.D. Course



Connection to Industry



We have connections with a number of IT companies and academies. If you want to connect with them, we will do our best to support you!

Letter from Professor



Dear students

I am actively looking for graduate-level students. If you want to apply to KAIST or have applied to KAIST, I can meet with you to talk about our research interests.

I encourage students to talk to many potential advisors (including me :-)) before they select one. If you want to talk to me for any reason regarding your research interest, please email me. If you are a KAIST student, I reply to all of your emails; 100% guaranteed.

We only need your interest, not talent.

