School of Electrical Enginnering

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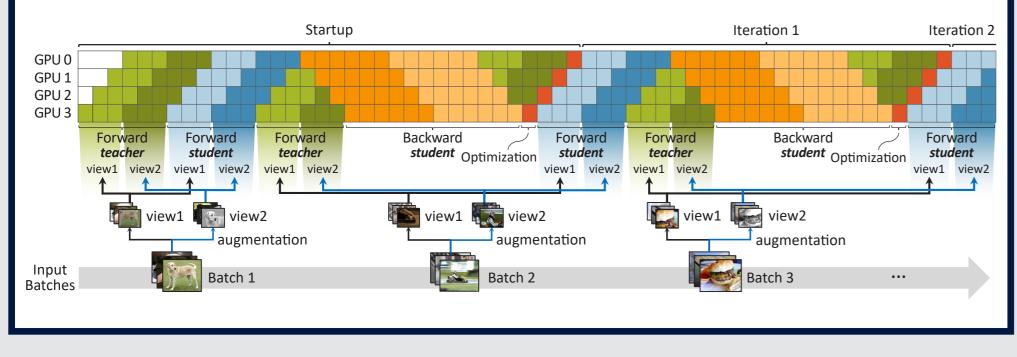
Graduate School of AI



Our Research

Systems for AI

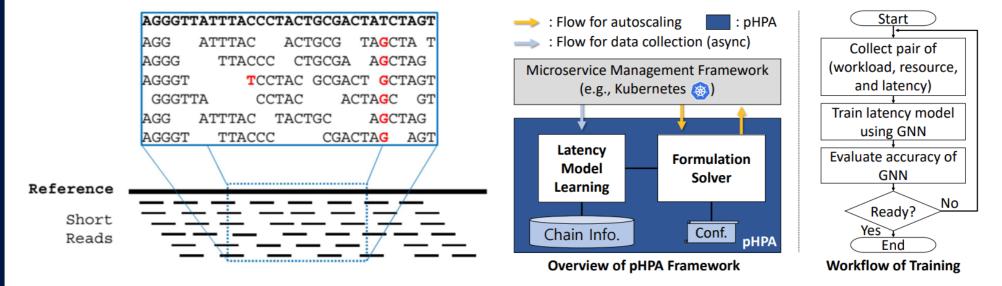
- Designing new frameworks for deep neural networks
- Large-scale AI/ML design with high utilization of multiple GPUs
- Maximizing memory efficiency of AI models while remaining statistical efficiency
- Accelerating training for deep neural network [ICML '22]



AI for Systems

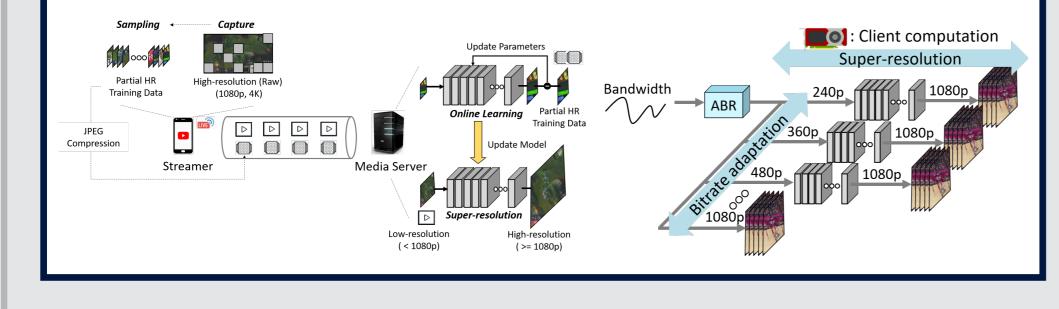
- Learned index in short read alignment [Bioinformatics '22] Accelerate DNA sequencing by introducing learned index and solving the exact match search problem for efficient seeding
- Microservice auto-scaling [CoNEXT '21] Auto-scale microservices for optimal resource utilization while meeting the service level objective (working with Toyota)
- 5G resource scheduling [CoNEXT '22] Dynamic resource scheduling to optimize the use of network resource and wireless spectral efficiency under 5G, 6G environments(working with Samsung)

AGGGTI	TATTTACCC	TACTGCG	ACTATCT	AGT
AGG	ATTTAC	ACTGCG	TAGCT	АТ
AGGG	TTACCC	CTGCG	A AGCT	AG
AGGGT	TCC	TAC GCG	ACT GCT	AGT
GGGTI	CA CC	TAC	ACTAGC	GT
AGG	ATTTAC	TACTGC	AGCT.	AG



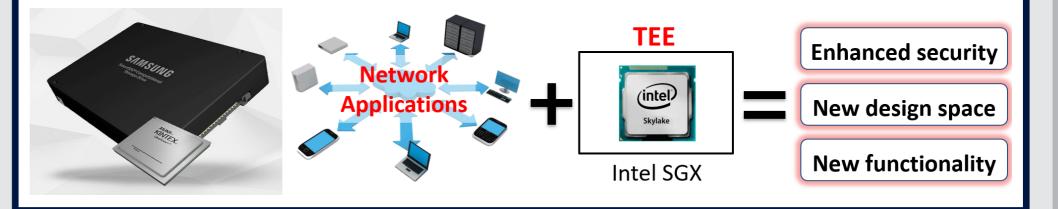
AI + Video

- HTTP adaptive streaming + neural super-resolution [USENIX OSDI '18] (First paper from KAIST in the history of OSDI)
- Live streaming + neural super-resolution [ACM SIGCOMM '20]
- Mobile + neural super-resolution [ACM MobiCom '20]
- Scalable neural super-resolution [ACM SIGCOMM '22]
- Codec + neural super-resolution [CVPR '23]



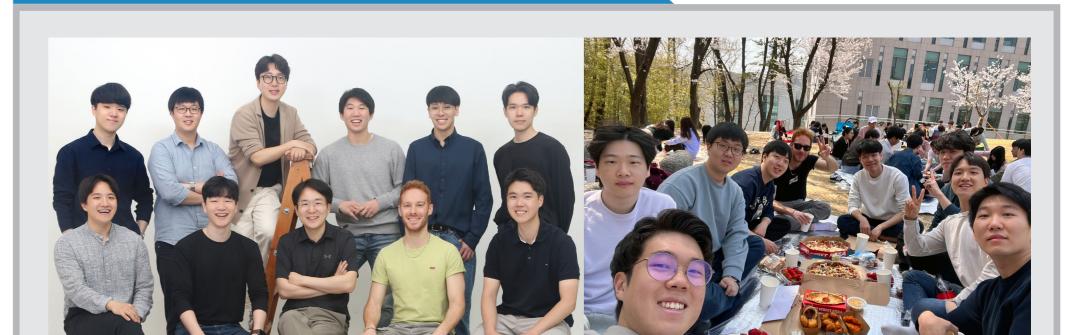
Cloud Systems

- 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 MAX PLANCK INSTITUTE 성신여자대학교 FOR SOFTWARE SYSTEMS Industry

Letter from Professor



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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!

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.

"Failure is an opportunity to grow'

l can learn to do anything I want' Challenges help me to grow My effort and attitude letermine my abilities" "Feedback is constructive am inspired by the success of other

"I like to try new things