

Joongi Kim

Curriculum Vitae

Seoul, South Korea
☎ +82 10-3159-4328
✉ joongi@lablup.com
📄 daybreaker.info
🌐 achimnol

Work Experiences

- 2016.07–
current **CTO & Co-founder, Lablup Inc.**, Seoul, South Korea.
Building Backend.AI cloud and its open-source version for on-demand machine learning and code execution service for research and education
- 2012.11–
2013.02 **Research Intern, Microsoft Research**, Cambridge, UK.
Analyzed the operation logs of a global-scale multi-tenant cloud service.
- 2009.06–
2010.01 **Software Engineering Intern, NexR**, Daejeon, South Korea.
Developed VM instance and Hadoop cluster management services.

Professional Activities

- 2026.06–
current **Member, Expert Council on Open Standards for AI Semiconductors (AI 반도체 개방형 표준 전문가 협의회)**, South Korea.
- 2025.09–
current **Member, Technical Standards Subcommittee, AI Trustworthiness Alliance (AI신뢰성얼라이언스 기술표준분과)**, South Korea.

Research Projects

- 2025–2029 **Principal Investigator (Lead Institution), IITP K-Cloud Project**, South Korea.
Development of Heterogeneous AI Chip Virtualization Technology (이종 AI 반도체 가상화 기술 개발)
- 2025–2030 **Principal Investigator (Participating Institution), IITP K-Cloud Project**, South Korea.
Implementation and Validation of an AI Semiconductor-Based Data Center Composible Cluster Infrastructure (AI반도체 기반 데이터센터 컴포저블 클러스터 인프라 구축 및 검증) — lead institution: HyperAccel
- 2025–2026 **Participant, Ministry of Science and ICT (과학기술정보통신부)**, South Korea.
Global Frontier Foundation Model Development and Domestic AI Innovation Ecosystem Project (글로벌 프런티어 파운데이션 모델 개발 및 국내 AI 혁신 생태계 조성 프로젝트) — 1st (2025 H2), 2nd (2026 H1), and 3rd (2026 H2) phases

Awards

- 2026 **KAIST 2025 Proud Alumni Award** (in the under-40 young alumni category)
- 2024 **Minister's Award (과학기술정보통신부 장관상) at ICT Tech-Industrialization Festival (ICT 기술사업화 페스티벌)** by Ministry of Science and ICT, Korea
- 2015 **Best Student Paper** in ACM EuroSys Conference
- 2012–2013 **Global PhD Fellowship** by National Research Foundation (NRF) of Korea
- 2005–2009 **Presidential Science Scholarship** by Korea Student Aid Foundation (KOSAF)

Ph.D. Thesis

Title	A High-Performance Packet Processing Framework for Heterogeneous Processors
Supervisor	Professor Sue Moon
Summary	I designed and implemented a world-first 80 Gbps Linux-based packet processing framework using CUDA GPUs and Intel Xeon Phi co-processors with adaptive load balancing.

Patents

KR10-2990740	실행 실패 기반 자원 요구량 조정을 이용한 작업 자동 복구 방법 및 장치 (Method and Apparatus for Automatic Job Recovery Using Execution-Failure-based Resource Requirement Adjustment). Jeongseok Kang, Joongi Kim
KR10-2759506, US12,688,544, JP7889922, CN ZL 2025 8 0000498.8	다중 딥러닝 모델의 사전훈련 계층과 미세조정 계층의 GPU 분리할당을 통한 다중 노드 클러스터 기반 추론 방법 및 시스템 (Multi-node Cluster-based Inference Method and System through GPU Separate Allocation of Pre-trained Layer and Fine-tuning Layer of Multiple Deep Learning Models). Joongi Kim, Jeongkyu Shin
KR10-2488390, US11,977,911	클러스터 상에서 다중 컨테이너 기반 연산 세션의 자동 스케일링 방법 및 시스템 (Method and System for Automatically Scaling Multi-container-based Computational Session on Cluster). Joongi Kim, Jonghyun Park, Jeongkyu Shin
KR10-2099118, US11,144,343	사용자가 요청한 다수개의 라이브러리를 탑재한 세션 컨테이너 제공 방법 (Method of Providing Session Container Mounted with Plurality of Libraries Requested by User). Joongi Kim, Jonghyun Park, Jeongkyu Shin
KR10-2032521, US11,221,888, JP2019-518972	컨테이너 기반의 GPU 가상화 방법 및 시스템 (Method and System for Container-based GPU Virtualization). Joongi Kim, Jonghyun Park, Jeongkyu Shin

Certifications

2019	AWS Certified Developer - Associate (DVA)
------	---

Highlighted Talks

2026	More Variants, More Diversity for AI Accelerators. PyCon KR, South Korea — https://speakerdeck.com/achimnol/pycon-kr-2026-more-variants-more-diversity-for-ai-accelerators
2026	Rethinking Infrastructure for Agentic AI: From Large-Scale AI Operations to Distributed Agent Execution. ITU AI for Good Summit, Geneva, Switzerland (Jul. 7, 2026)
2025	AI 시대를 위한 Python 패키징. PyCon KR, South Korea — https://speakerdeck.com/achimnol/pycon-kr-2025-ai-sidaereul-wihan-python-paekijing
2024	파이콘과 나의 10년 되돌아보기 (Keynote). PyCon KR, Suwon, South Korea
2024	엔터프라이즈 공급을 위한 파이썬 엔지니어링. PyCon KR, Suwon, South Korea
2024	From Idea To Crowd: Manipulating Local LLMs At Scale. NVIDIA GTC Silicon Valley [S62992]

- 2023 **Improving debuggability of complex asyncio applications.**
PyCon US, KR & APAC — <https://bit.ly/joongi-talk-pyconapac2023>
- 2022 **Pantsbuild를 활용하여 대규모 Python 프로젝트를 모노리포로 이전하기.**
PyCon KR & JP — <https://bit.ly/joongi-talk-pyconkr2022>
- 2021 **The next-generation SQLAlchemy with asyncio.**
PyCon KR & APAC — <http://bit.ly/joongi-talk-pyconkr2021>
- 2020 **Backend.AI에 점진적 typing 적용하기.**
PyCon KR — <http://bit.ly/joongi-talk-pyconkr2020>
- 2020 **Accelerating Hyperparameter Tuning with Container-level GPU Virtualization.**
NVIDIA GTC Online [A21249]
- 2019 **Real-world asyncio.**
PyCon KR — <http://bit.ly/joongi-talk-pyconkr2019>
- 2019 **Improving GPU utilization for multi-tenant deep-learning workloads on DGX-2 and public GPU clouds.**
NVIDIA GTC Silicon Valley [S9406] — <http://bit.ly/joongi-talk-gtc2019>
- 2018 **Browsing Modern TensorFlow.**
GDG DevFest Seoul — <http://bit.ly/joongi-talk-gdgdevfest2018>
- 2018 **From Backend.AI to AIN: The Future of Cheaper, Faster, and Safer AI Development.**
SOSCON — <http://bit.ly/joongi-talk-soscon2018>
- 2018 **Callosum: An RPC Transport Library.**
PyCon KR — <http://bit.ly/joongi-talk-pyconkr2018>
- 2017 **Meet aiotoools: asyncio idiom library.**
PyCon KR — <http://bit.ly/joongi-talk-pyconkr2017>
- 2016 **High-Performance Networking with Python.**
PyCon APAC — <http://bit.ly/joongi-talk-pyconapac2016>
- 2016 **Exploring Low-latency Interconnect for Scaling-Out Software Routers.**
HiPINEB (IEEE Workshop) — <http://bit.ly/joongi-talk-hipineb2016>
- 2015 **Designing a Python-based Data Analysis / Online Coding Platform for Researchers and Educators.**
PyCon KR — <http://bit.ly/joongi-talk-pyconkr2015>
- 2015 **Network Balancing Act.**
ACM EuroSys — <http://bit.ly/joongi-talk-eurosys2015>

Publication

- 2019 **Enveloping Implicit Assumptions of Intrusive Data Structures within Ownership Type System.**
Keunhong Lee, Jeehoon Kang, Wonsup Yoon, *Joongi Kim*, Sue Moon
Workshop on Programming Languages and Operating Systems (PLOS 2019), Huntsville, Ontario, Canada
- 2016 **Exploring Low-latency Interconnect for Scaling Out Software Routers.**
Sangwook Ma, *Joongi Kim*, Sue Moon
2nd IEEE International Workshop on High-Performance Interconnection Networks in the Exascale and Big-Data Era (HiPINEB), Barcelona, Spain
- 2015 **NBA (Network Balancing Act): A High-performance Packet Processing Framework for Heterogeneous Processors** — Best Student Paper.
Joongi Kim, Keon Jang, Keunhong Lee, Sangwook Ma, Junhyun Shim, Sue Moon
ACM EuroSys, Bordeaux, France

- 2015 **KENSv2: An Educational Networking Framework for Full Layer Implementation and Testing.**
Keunhong Lee, *Joongi Kim*, Sue Moon
ACM SIGCSE, Kansas City, United States
- 2012 **The Power of Batching in the Click Modular Router.**
Joongi Kim, Seonggu Huh, Sangjin Han, Keon Jang, KyoungSoo Park, Sue Moon
3rd ACM Asia-Pacific Systems Workshop (APSys), Seoul, South Korea
- 2011 **Modularity Meets Batching: Towards an Experimental Platform for High-speed Software Routers** (poster).
Joongi Kim, Seonggu Huh, Sangjin Han, Keon Jang, KyoungSoo Park, Sue Moon
23rd ACM Symposium on Operating Systems Principles (SOSP), Cascais, Portugal
- 2010 **Dynamic Forwarding Table Management for High-speed GPU-based Software Routers** (poster).
Joongi Kim, Keon Jang, Sangjin Han, KyoungSoo Park, Sue Moon
9th USENIX Symposium on Operating Systems Design and Implementation (OSDI), Vancouver, Canada
- 2004 **String Matching Algorithm for Real-time Intrusion Detection and Response.**
Jooyeop Kim, *Joongi Kim*, Narae Han, Seonghoon Kang, Sanghoo Lee, Hongjin Yeh
Proceedings of the 31th KISS Spring Conference, Daejeon, South Korea

Open Source Projects and Activities

- 2023–current **aiomonitor**, *Independent*.
Side-channel monitoring and debugging helper for Python asyncio apps, used in Backend.AI
<http://github.com/aio-libs/aiomonitor>
- 2017–2019 **4th/5th Open Frontier OSS Part-timer**, *NIPA*.
Contributed to Backend.AI and related projects. Spread open source participation guides.
- 2017–current **aiotools**, *Independent*.
Collection of commonly used patterns for Python asyncio apps, used in Backend.AI
<http://github.com/achimnol/aiotools>
- 2016–current **Backend.AI**, *Lablup Inc.*
Architecture design and implementation
<http://www.backend.ai>
- 2015–2016 **NBA (Network Balancing Act)**, *KAIST*.
Modular packet processing framework using heterogeneous accelerators (CUDA, OpenCL, Xeon Phi) on top of Intel DPDK
<https://github.com/anlab-kaist/NBA>
- 2006–current **Textcube**, *TNF/Needlworks*.
Core framework and the Google Maps plugin
<http://www.textcube.org>
- 2008–2016 **Hangul iPuTTY**, *Independent*.
Korean IME support and font separation for Unicode CJK characters of the infamous Windows SSH terminal
<https://bitbucket.org/daybreaker/iputty>
- 2009 **OTL (Online Timeplanner for Lectures)**, *KAIST SPARCS*.
Backend and frontend (time-table UI), integration with KAIST school database, operated using the initial version for about 10 years
<https://otl.kaist.ac.kr>
- 2009 **CCIU: Open Course Labs**, *NexR*.
Web-based cloud resource manager for university courses
<https://github.com/achimnol/cciu-open-course-labs>

Education

- 2012–2016 Ph.D. in Computer Science, *KAIST*, Daejeon, South Korea.
- 2010–2012 Master in Computer Science, *KAIST*, Daejeon, South Korea.
- 2005–2010 Bachelor in Computer Science, *KAIST*, Daejeon, South Korea.
- 2003–2004 Gyeonggi Science High School, Suwon, South Korea.