

# Joongi Kim

## Curriculum Vitae

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### 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.

### Awards

- 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

- <sup>KR</sup>10-2488390,  
<sup>US</sup>11,977,911 **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
- <sup>KR</sup>10-2099118,  
<sup>US</sup>11,144,343 **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
- <sup>KR</sup>10-2032521,  
<sup>US</sup>11,221,888,  
<sup>JP</sup>2019-518972 **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)**

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## Highlighted Talks

- 2024 **파이콘과 나의 10년 되돌아보기 (Keynote).**  
PyCon KR, Suwon, South Koera
- 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 aiotools: 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>

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## 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

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## 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/Needworks*.  
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>

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## 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.