Kiwan Maeng

Contact Information

CIC 4th floor
Carnegie Mellon University
4720 Forbes Avenue Pittsburgh, PA 15213

Homepage: https://kiwanmaeng.com
Email: kmaeng@andrew.cmu.edu

Research Interests

My research interests lie in building efficient and reliable systems for environments where a machine failure is frequent. My past work concentrated particularly on energy-harvesting IoT devices and large-scale distributed machine learning training systems, which are both prone to frequent machine failures.

Research Area: Machine Learning, Deep Learning, Recommendation System, Distributed Training; Intermittent Computing, Energy-Harvesting Devices, Embedded Systems, IoT, Hardware-Software Co-Design, Compilers

Education

Carnegie Mellon University, Pittsburgh, PA — Aug 2016 –
Ph.D. in Electrical and Computer Engineering
- Advisor: Prof. Brandon Lucia

Seoul National University, Seoul, Korea — Aug 2016
B.S. in Electrical and Computer Engineering
Graduated with Summa Cum Laude (GPA: 4.14/4.30)

Referred Papers

[1] Adaptive Low-overhead Scheduling for Periodic and Reactive Intermittent Execution
Kiwan Maeng and Brandon Lucia
PLDI 2020 - Programming Language Design and Implementation

[2] Enhancing Stratospheric Weather Analysis and Forecasts by Deploying Sensors from a Weather Balloon
Kiwan Maeng, Iskender Kushan, Brandon Lucia, and Ashish Kapoor
NeurIPS 2019 Workshop (spotlight talk) - Conference on Neural Information Processing Systems

[3] Supporting Peripherals in Intermittent Systems with Just-In-Time Checkpoints
Kiwan Maeng and Brandon Lucia
PLDI 2019 - Programming Language Design and Implementation

[4] Adaptive Dynamic Checkpointing for Safe Efficient Intermittent Computing
Kiwan Maeng and Brandon Lucia
OSDI 2018 - USENIX Symposium on Operating Systems Design and Implementation

[5] Alpaca: Intermittent Execution without Checkpoints
Kiwan Maeng, Alexei Colin and Brandon Lucia
OOPSLA 2017 - Object-Oriented Programming, Systems, Languages & Applications

[6] Intermittent Computing: Challenges and Opportunities
Brandon Lucia, Vignesh Balaji, Alexei Colin, Kiwan Maeng, and Emily Ruppel
SNAPL 2017

Other Papers

[7] Getting Started with Intermittent Computing
Brandon Lucia, Emily Ruppel, Kiwan Maeng, Graham Gobieski and Milijana Surbatovich
MICRO 2018 Tutorial

[8] The Midnight Engineers (Book, Korean)
Kiwan Maeng
Science comicbook for non-majors (LINK).
Won several awards including *10 Authors of the Year 2017*.

Awards & Honors

Korea Foundation for Advanced Studies Scholarship, KFAS — 2016 – 2021
Summa Cum Laude, Seoul National University — Aug 2016
National Scholarship for Science & Engineering, KOSAF — 2010 – 2016

Work Experience

Facebook AI Research SysML Team, Boston, MA — May – Aug 2020
Research Scientist Intern with Prof. Carole-Jean Wu
• Tasks: Research in large-scale distributed recommendation system training. To be updated with more detail.
• Skills: Pytorch, machine learning, distributed system design, Python

Microsoft Research, Seattle, WA — May – Aug 2019
Research Scientist Intern with Ashish Kapoor
• Tasks: Developing a hardware system and a machine learning (ML) algorithm for improving the precision of the weather forecast [2].
• Skills: C, PCB design, Python, machine learning, embedded system design

Carnegie Mellon University, Pittsburgh, PA — Sep 2016 –
Research Assistant with Prof. Brandon Lucia
• Tasks: Developing hardware and software systems for energy-harvesting IoT devices [1, 3–7].
• Skills: embedded system design, C, C++, LLVM (backend), Clang (frontend), Python, TI MSP430, GNU make

Seoul National University, Seoul, Korea — March 2015 – Aug 2016
Research Intern with Prof. Hyuk-Jae Lee
• Tasks: Developed hardware for computer vision.
• Skills: Verilog, C, FPGA

Rsupport Inc., Seoul, Korea — Feb 2013 – Dec 2015
QA Engineer
• Tasks: Developed internal test automation framework.
• Skills: Java, Selenium

Graduate Coursework

18-748 Wireless Sensor Networks	Spring 2018
18-643 Reconfigurable Logic: Technology, Architecture and Applications	Fall 2017
18-797 Machine Learning for Signal Processing	Fall 2017
15-745 Optimizing Compilers for Modern Architectures	Spring 2017
18-742 Advanced Computer Architecture and Systems	Spring 2017
14-642 Introduction to Embedded Systems	Fall 2016
18-743 Energy Aware Computing	Fall 2016

Technical Skills

• C (Advanced) / C++, Python (Experienced) / Verilog, Java, Swift (Intermediate)
• Developing compilers using Clang (frontend) and LLVM (backend).
• Designing a distributed machine learning training system using Pytorch.
• Designing embedded systems.

References Available on request