Jaemin Choi

PhD Candidate, Department of Computer Science
jchoi157@illinois.edu
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RESEARCH TOPICS
High Performance Computing, CPU-GPU Heterogeneous Computing, Distributed Deep Learning, Performance Modeling

EDUCATION

Doctor of Philosophy (PhD), Computer Science
Univeristy of Illinois Urbana-Champaign - Urbana, Illinois
Aug 2016 - Present

Bachelor of Science (BS), Computer Science and Engineering
Seoul National University - Seoul, Korea
Mar 2010 - Feb 2016

EXPERIENCE

Research Assistant Aug 2016 - Present
Parallel Programming Laboratory, University of Illinois Urbana-Champaign

- GPU support in the Charm++ parallel programming system
  - Managing asynchronous progress of fine-grained, heterogeneous tasks for overlap of computation and communication
  - Host-bypass messaging between objects with GPU-resident data using CUDA IPC and GPUDirect RDMA
- Heterogeneous, data-parallel distributed deep learning with data partitioning between CPU and GPU
- GPU-accelerated mini-apps: Jacobi iterative method, Barnes-Hut N-body simulation, and adaptive mesh refinement (AMR)
- Low-latency RDMA message transfers with Infiniband Verbs API

Research Intern May - Aug 2019
Center for Applied Scientific Computing, **Lawrence Livermore National Laboratory** - Livermore, CA

- Performance modeling and optimization of GPU-accelerated Exascale Computing Project (ECP) proxy applications, including SW4lite and MiniFE

Technology Research Intern May - Aug 2018
Walt Disney Animation Studios - Burbank, CA

- Memory usage optimization via de-duplication in Hyperion, a parallel path tracing based rendering framework

Undergraduate Research Assistant Jun 2015 - Apr 2016
Center for Manycore Programming, Seoul National University

- Developed Linux kernel module for distributed shared memory implementation of SnuCL using RDMA

Undergraduate Research Assistant Feb - Jun 2015
Computer Systems and Platforms Laboratory, Seoul National University

- Developed Linux network driver for A2 operating system on Intel Single-chip Cloud Computer (SCC)

PUBLICATIONS

Fast Profiling-based Performance Modeling of Distributed GPU Applications
ACM Student Research Competition (SRC) Poster, SC '19

Runtime Support for Concurrent Execution of Overdecomposed Heterogeneous Tasks
ACM Student Research Competition (SRC) Poster, SC '17

TALKS

Improving the Performance of Overdecomposed Applications on GPU-accelerated Systems
15th CSL Student Conference (CSLSC 2020), **Best Presentation Award**

Messaging with GPU-resident Data
Charm++ and AMPI: Adaptive and Asynchronous Parallel Programming, Birds of a Feather, SC'19

Distributed Deep Learning: Leveraging Heterogeneity and Data-Parallelism
17th Annual Workshop on Charm++ and Its Applications (2019)

Interoperability of Shared Memory Parallel Programming Models with Charm++
17th Annual Workshop on Charm++ and Its Applications (2019)

Recent Advances in Heterogeneous Computing using Charm++
16th Annual Workshop on Charm++ and Its Applications (2018)

Migratable Objects and Task-Based Parallel Programming with Charm++
Tutorial, SC'17

AWARDS & HONORS

Best Presentation Award (HPC Session) — Feb 2020
CSL Student Conference, University of Illinois Urbana-Champaign

Graduated with Honors (Cum Laude) — Feb 2016
Seoul National University

National Science and Technology Scholarship — Mar 2010 - Feb 2016
Korea Scholarship Foundation

ACTIVITIES

General Chair — May 2019
17th Annual Workshop on Charm++ and Its Applications

Publicity Chair — Apr 2018
16th Annual Workshop on Charm++ and Its Applications

Student Volunteer — Nov 2017
SC'17, Denver, Colorado

SNU Tomorrow's Edge Membership (STEM) — Dec 2014 - Feb 2016
Honor Society, College of Engineering, Seoul National University

Korean Augmentation to the United States Army (KATUSA) — Apr 2011 - Jan 2013
Military Service, KATUSA Training Academy/NCO Academy, Camp Jackson

TECHNICAL SKILLS

Programming Languages: C++, C, Python
Parallel/Distributed Programming: CUDA, OpenMP, MPI, Charm++