

JONG WOOK KIM

SOFTWARE ENGINEER · DATA SCIENTIST · MUSIC INFORMATICIST

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“Vouloir, c’est pouvoir”

Employment

New York University

RESEARCH ASSISTANT

New York, NY

Apr 2016 - Present

- **Analyzing and improving the collaborative filtering algorithms** for music recommendation at iHeartRadio, focusing on the relations between multiple entities using techniques including factorization machines, collective matrix factorization, and hypergraph learning.

Kakao Corporation

RECOMMENDER SYSTEM ENGINEER & DATA SCIENTIST

Seongnam, S. Korea

Jun 2014 - Aug 2015

- **Developed Apache Spark applications for the company’s recommender systems** which were gradually being migrated from Apache Hive, and built a framework around Spark called CueSheet, which helps simplify the development cycle of Spark jobs by automating the application packaging and separating the concerns of the implementation and the configuration.
- **Developed a distributed API server in Scala** that delivers personalized recommendations in various domains, which were precomputed and stored in the databases such as HBase and Couchbase. The deployment and scaling was managed using Marathon, and the system supported bucket testing for evaluating different recommendation algorithms on-line.
- **Designed and developed a distributed and fault-tolerant stream processing framework** built atop Apache Kafka, providing stream manipulation primitives such as filter, transformer and joiner for the modular implementation of streaming jobs. Joiner, in particular, leveraged in-memory data grids to combine two input streams which may have arbitrarily ordered data in real-time.
- **Made a core utility library in Scala** for the API servers and Spark applications being developed in the team, focusing on the simple and thread-safe usage. In addition to the basic IO and JSON conversion utilities, the library enabled easier nonblocking access to various endpoints that the team was using, including Elasticsearch, ZooKeeper, OpenTSDB, HBase, Couchbase, and HTTP servers.
- **Leveraged OpenTSDB and Grafana to record and visualize the real-time statistics** of the various kinds of applications running in the distributed architecture. Using ring buffers, the systems were able to publish real-time metrics without affecting the performance, and they were reflected in the report within seconds, helping quickly identify the trends as well as any unexpected behaviors.
- Built and maintained a Jenkins cluster that runs mission-critical Hadoop jobs for the company’s recommender systems.

NCSoft Corporation

GAME SERVER PLATFORM DEVELOPER

Seoul & Seongnam, S. Korea

Aug 2012 - Jun 2014

- **Designed and developed a distributed server platform** for Lineage Eternal, the company’s upcoming massively multiplayer online role-playing game (MMORPG). The platform was composed of a number of fault-tolerant clusters of Java and C++ servers, built using Netty/RxJava and Boost ASIO for the asynchronous and nonblocking IO. Its goal was to make the game playable without requiring the users to select and be limited to only one among many game servers.
- Built a cross-platform logging library in C++ that resembles SLF4j, to be used in Lineage Eternal’s game servers.
- Managed the Perforce source control server, which had millions of files being shared among the team of 100+ members.

NCSoft Corporation

GAME DEVELOPER INTERN

Seoul, S. Korea

May 2011 - Aug 2011

- Developed the pathfinding engine of Lineage Eternal, used in both the game client and server, built on top of Havok AI.

University of Michigan

EDUCATIONAL SOFTWARE DEVELOPER

Ann Arbor, MI

May 2010 - Aug 2010

- Developed interactive educational software visualizing molecular movements in Processing, for the thermodynamics class.

Techno Press

WEB DEVELOPER & SYSTEM ADMINISTRATOR

Daejeon, S. Korea

Jan 2009 - Jun 2009

- Developed a website for Techno Press, a publisher of international journals in the field of civil engineering.

Education

New York University

PH.D. (IN PROGRESS) IN MUSIC TECHNOLOGY

New York, NY

Sep 2011 - May 2012, Sep 2016 - Present

- Advised by Dr. Juan Pablo Bello, expected graduation in 2019. GPA 3.76/4.00
- The area of research includes music information retrieval, automatic music transcription, and music recommendation.
- Relevant coursework: Probabilistic Graphical Models, Statistical Natural Language Processing, Convex Optimization, Deep Learning.

University of Michigan

M.S. IN COMPUTER SCIENCE AND ENGINEERING

Ann Arbor, MI

Sep 2009 - Apr 2011

- Advised by Dr. Georg Essl, focusing on intelligent systems and interactive music environments. GPA 7.76/9.00
- Relevant coursework: Machine Learning, Information Theory, Advanced Compilers, Advanced Computer Network

Korea Advanced Institute of Science and Technology

B.S. IN ELECTRICAL ENGINEERING WITH A MINOR IN MATHEMATICAL SCIENCES

Daejeon, S. Korea

Sep 2006 - May 2009

- GPA 3.83/4.30, with 3.97/4.30 in electrical engineering and 4.03/4.30 in mathematical sciences.

Imperial College London

UNDERGRADUATE RESEARCH OPPORTUNITY PROGRAM IN THE DEPARTMENT OF MECHANICAL ENGINEERING

London, UK

Jul 2006

- Developed tools for preprocessing data to be used in finite element method software

Korea Science Academy of KAIST

Busan, S. Korea

Mar 2004 - Aug 2006

Teaching

New York University

TEACHING ASSISTANT - MPATE-GE 2623 MUSIC INFORMATION RETRIEVAL, EL9173 AUDIO CONTENT ANALYSIS

New York, NY

Sep 2015 - May 2016

- Assisted in teaching the concepts of music informatics, held office hours, and graded written and programming assignments.

University of Michigan

GRADER - EECS492 INTRODUCTION TO ARTIFICIAL INTELLIGENCE

Ann Arbor, MI

Jan 2011 - Apr 2011

- Graded written and programming assignments.

Korea Advanced Institute of Science and Technology

TEACHING ASSISTANT - CS101 INTRODUCTION TO PROGRAMMING

Daejeon, S. Korea

Sep 2008 - May 2009

- Taught the basic concepts of object-oriented programming in Java and graded programming assignments.

KAIST Global Institute for Talented Education

HEAD TEACHING ASSISTANT - INFORMATION CLASSES

Daejeon, S. Korea

Dec 2006 - Jan 2008

- Developed materials and taught college-level computer science and electrical engineering to high school students.

Publication

Concepts and practical considerations of platform-independent design of mobile music environments

J. W. KIM & G. ESSL, IN *Proceedings of the International Computer Music Conference*

Jul 2011

Presentations

MusicProcessing.jl: Music Information Retrieval in Julia

JULIACON 2016

Cambridge, MA

Jun 2016

Functional Reactive Programming with dart:async

GDG DEVFEST KOREA 2014

Seoul, S. Korea

May 2014

Building High Performance Servers with Rx and Functional Reactive Programming

NEXON DEVELOPER CONFERENCE 2014

Seongnam, S. Korea

May 2014

Honors & Awards

- 2010 **Samsung Scholarship** USD 50,000 per year, for 5 years of the Ph.D. program
2009 **Kwanjeong Scholarship** USD 50,000 per year, for 2 years of the M.S. program
2008 **Meritorious Winner** in the COMAP Mathematical Contest in Modeling 2008
2006 **Korea Presidential Scholarship** KRW 10,000,000 per year, for 4 years of the B.S. program

Software Projects

Apache S2Graph	Contributing to the Apache Incubator project, a distributed OLTP graph database.
MusicProcessing.jl	A Julia library for music and audio processing.
spark-ranking-metrics	A Spark implementations of common evaluation metrics for ranking algorithms.
eval-archiver-loader	A simple utility for compiling Scala code on-the-fly into a byte array and loading it dynamically.
lyomiTerm	a MacOS telnet client and VT100 emulator for legacy Korean bulletin board services (BBS).
Pie	an iOS telnet client and VT100 emulator for legacy Korean bulletin board services (BBS).
Croissant	A Chrome app built with NaCl and TypeScript for music streaming using Google Drive as a storage.
VBAP	An iOS application that implements vector base amplitude panning (VBAP) using the accelerometer.
Yomi	A code viewer app for iPad, using libgit2 to clone Git repositories.

Skills

Programming	Scala, Python, Java, C/C++ professionally, and Julia, ObjC, PHP, JS, TS, Matlab for personal/research projects
Music	Played the oboe in many orchestras and the piano in bands. Also have played the viola and taepyeongso.
Languages	English (full professional fluency), Korean (native), Japanese (limited working proficiency)