DONGWON KIM

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ABOUT ME

Dongwon Kim is a software engineer conducting data analysis and applying machine-learning techniques, cloud computing techniques. He focused on context–aware systems providing indoor/outdoor localization with managing and optimizing the energy consumption for mobile devices into Linux kernel. Now, he is a part of a music recommendation team, while contributing to the recommender system by applying collaborative/content-based filtering. Consequently, his activities include machine learning, cloud computing, and mobile sensing.

Interests	Cloud computing, Data engineering, Recommender system
Programming Languages	Python, C, Unix shell scripts, Scala, Java
Technical Keywords	Spark, MapReduce, Hive, Presto, HBase, Airflow, Consul, Nomad, Kafka, RabbitMQ, Faiss, Annoy

EXPERIENCE

Music Recommender System Oct. 2016 - Present
NAVER, KOREA

· **Data Pipeline**
- Collecting and cleansing the massive data of log, artist, song, and so on in Hadoop environments (Python, Spark, Hive).
- Development of a content pipeline for audio feature extraction with various trained models automatically for cold-items (Python, Pyarrow, RabbitMQ).

· **Item-to-item Recommendation**
- Song and artist recommendation which you may also like based on word2vec and topic model (Gensim, Spark MLLib, Fasttext).
- Similarity search between millions of items while maintaining up-to-date information (Annoy, Faiss, Spark).
- Modeling Musical instrument classifier with audio content data and convolutional neural networks (Keras).
- Song recommendation from natural language based on word embeddings (Gensim, Fasttext).
- Clustering duplicated tracks among millions of songs using song information and audio contents (Spark, Hive).

· **Song Recommendation**
- Discover Songs: providing songs for each user which is not listened yet applying a mixture of collaborative filtering and content-based filtering method (Spark, Hive).
- Development of a real-time recommender system applying various parameters such as seed songs or artists while applying user's listening feedback (Python, Redis).
- Design and development of A/B test platform (Spring Boot, Spark, HBase).

Mobile Sensing System Sept. 2015 - Sept. 2016
NAVER, KOREA

· **Indoor and Outdoor Localization Systems with WiFi Fingerprinting**
- Development for place recognition in urban environment applying piggyback sensing energy efficiently (Android).

· **Long-lived Fitness Tracking Systems for Smart-bands**
- Firmware development for wrist action recognition and step counting with only accelerometer.

PUBLICATIONS

Deep Learning (3 papers)

- [D01] Byungsoo Jeon, Adrian Kim, Chanju Kim, **Dongwon Kim**, Jangyeon Park, Jung-Woo Ha, "Music Emotion Recognition via End-to-End Multimodal Neural Networks," *Proceeding of the 11th ACM Conference on Recommender Systems* (RecSys 2017), Como, Italy, Aug. 2017
- [D02] Jung-Woo Ha, Adrian Kim, **Dongwon Kim**, Chanju Kim, Jangyeon Park, "Music Highlight Extraction via Convolutional Recurrent Attention Networks," *Machine Learning for Music Discovery Workshop in International Conference on Machine Learning* (ICML), Aug, 2017.
- [D03] Jung-Woo Ha, Adrian Kim, **Dongwon Kim**, Jeonghee Kim, Jeong-Whun Kim, Jin Joo Park, Borim Ryu, "Predicting High-risk Prognosis from Diagnostic Histories of Adult Disease Patients via Deep Recurrent Neural Networks," *2017 IEEE International Conference on Big Data and Smart Computing* (BigComp), Jeju, South Korea, Feb, 2017

Mobile Sensing (3 papers)

- [M01] Taehwa Choi, Yohan Chon, Yungeun Kim, **Dongwon Kim**, Hojung Cha, "Enhancing WiFi-Fingerprinting Accuracy Using RSS Calibration in Dual-Band Environments," *Pervasive and Mobile Computing* (PMC), vol.30, pp.45-57
- [M02] Yohan Chon, Suyeon Kim, Seungwoo Lee, **Dongwon Kim**, Yungeun Kim, Hojung Cha, "Sensing WiFi Packets in the Air: Practicality and Implications in Urban Mobility Monitoring," *2014 ACM International Joint Conference on Pervasive and Ubiquitous Computing* (UbiComp 2014), Seattle, WA, USA, 2014
- [M03] Nicholas D. Lane, Yohan Chon, Lin Zhou, Yongzhe Zhang, Fan Li, **Dongwon Kim**, Guanzhong Ding, Feng Zhao, Hojung Cha, "Piggyback CrowdSensing (PCS): Energy Efficient Crowdsourcing of Mobile Sensor Data by Exploiting Smartphones App Opportunities," *11th ACM Conference on Embedded Networked Sensor Systems* (SenSys 2013), Rome, Italy, 2013.

Power Management (9 papers)

- [P01] **Dongwon Kim**, Nohyun Jung, Yohan Chon, Hojung Cha, "Content-Centric Energy Management of Mobile Displays," *IEEE Transactions on Mobile Computing* (TMC), vol.15, no.8, pp.1925-1938
- [P02] **Dongwon Kim**, Yohan Chon, Wonwoo Jung, Hojung Cha, "Accurate Prediction of Available Battery Time for Mobile Applications," *ACM Transactions on Embedded Computing Systems* (TECS), vol.15, no.3, pp.48
- [P03] Sewook Park, **Dongwon Kim**, Hojung Cha, "Reducing Energy Consumption of Alarm-induced Wake-ups on Android Smartphones," *ACM The 16th International Workshop on Mobile Computing Systems and Applications* (HotMobile 2015), Santa Fe, USA, Feb, 2015
- [P04] **Dongwon Kim**, Nohyun Jung, Hojung Cha, "Content-Centric Display Energy Management for Mobile Devices," *2014 ACM The 51st Annual Design Automation Conference* (DAC 2014), San Francisco, CA, USA, 2014
- [P05] Wonwoo Jung, Yohan Chon, **Dongwon Kim**, Hojung Cha, "Powerlet: an Active Battery Interface for Smartphones," *2014 ACM International Joint Conference on Pervasive and Ubiquitous Computing* (UbiComp 2014), Seattle, WA, USA, 2014
- [P06] **Dongwon Kim**, Wonwoo Jung, Hojung Cha, "Runtime Power Estimation of Mobile AMOLED Displays," *2013 ACM The Conference on Design, Automation and Test in Europe* (DATE 2013), Grenoble, France, 2013
- [P07] Wonwoo Jung, Chulkoo Kang, Chanmin Yoon, **Dongwon Kim**, Hojung Cha, "DevScope: A Nonintrusive and Online Power Analysis Tool for Smartphone Hardware Components," *2012 ACM The International Conference on Hardware/Software Codesign and System Synthesis* (CODES+ISSS 2013), Tampere, Finland, 2012
- [P08] Chanmin Yoon, **Dongwon Kim**, Wonwoo Jung, Hojung Cha, "AppScope: Application Energy Metering Framework for Android Smartphone using Kernel Activity Monitoring," *2012 USENIX Annual Technical Conference* (USENIX ATC 2012), Boston, MA, USA, 2012
- [P09] Wonwoo Jung, **Dongwon Kim**, Hojung Cha, "Observing Thermal Characteristics of Energy-Aware Mobile Devices," *2012 IEEE The International Conference on Embedded and Real-Time Computing Systems and Applications* (RTCSA 2012), Seoul, Korea, 2012