Taehoon Kim

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RESEARCH INTERESTS

Machine Learning, Computer Vision, Information Retrieval

EDUCATION

Ulsan National Institute of Science and Technology (UNIST), Ulsan, South Korea

Bachelor of Science (B.S.) in Computer Science & Engineering — Mar 2011 – Aug 2015
Adviser: Professor Jaesik Choi

ACADEMIC HONORS & AWARDS

Student Cluster Challenge, Finalist — Jun 2014
International Supercomputing Conference 2014
One of 11 undergraduate teams selected through the preliminary contest. Utilize a cluster, which is composed of 8 different nodes with Intel Xeon processors and a Nvidia K40 GPU accelerator.

Korea Whitehat Contest 2013, 3rd place — Sep 2013
Ministry of National Defense and National Intelligence Service
Awarded by the Minister of National Defense. Received an award of $8,000.

Asia student Supercomputing Challenge 14, Finalist — Apr 2014
One of 16 teams among 82 international teams selected through the preliminary contest. Participate as a team adviser and utilize a cluster, which is composed of 6 different nodes with Intel Xeon processors and Nvidia Titan GPU accelerator.

PUBLICATIONS

1) T. Kim and J. Choi, *Reading documents for bayesian Online Change Point Detection* in Empirical Methods on Natural Language Processing **(EMNLP 2015)**, 2015

RESEARCH EXPERIENCE

Lawrence Berkeley National Laboratory, California, USA
Undergraduate Research Student — Jul 2015 – Present
- Identify energy use patterns in smart meter data, and relate these patterns to actions of households.
- Detect changes in energy use patterns related to energy savings from time and behavior based programs.
- Make predictions about energy patterns in order to estimate unmet savings potential.

Probabilistic Artificial Intelligence Lab, UNIST
Undergraduate Research Student — Sep 2014 – Sep 2015
- Improved Bayesian Online Change Point Detection by Reading Texts
- Food Image Recognition: Combination of Deep Convolutional Features and Shallow Encoded Features
- Generative model for Korean poetry using Multi-layer LSTM for Character-level Language
- Language-specific Sentiment Analyzer using Morpheme Analysis

Mobile Smart Networking Laboratory, UNIST
Undergraduate Research Student — Jan 2013 – Aug 2014
- Optimizing Mobile Video Streaming: From Context-aware Scheduling to Cloud-assisted Caching
- Optimizing Mobile Web browsing: Through Page Caching in Local Access Point

RESEARCH TOPICS

Improved Bayesian Online Change Point Detection by Reading Texts
Probabilistic Artificial Intelligence Lab — Oct 2014 – Present
Propose a new Document based Bayesian Online Change Point Detection (DBO-CPD) model which can incorporate external information in texts such as news articles to overcome the drawback of original BO-CPD, which is vulnerable to signal noise because of the assumption of the Markov property. By reading texts which may include the primary causes of many changes, verify that DBO-CPD enables to predict long-term changes accurately in real-world data sets: stock prices, currency exchange and movie reviews.

Improved Image Classification: Combination of Deep Convolutional Features and Shallow Encoded Features
Probabilistic Artificial Intelligence Lab — Oct 2014 – Dec 2014
Propose an automatic food image recognition system for 100 food categories by fusing various kinds of handcrafted image features including Fisher Vectors with SIFT and HOG descriptors. In addition, we used extracted features from Deep Convolutional Neural Network to get a benefit from the state-of-the-art research results which was done by large-scale image classification.

Optimizing Mobile Video Streaming: From Context-aware Scheduling to Cloud-assisted Caching
Mobile Smart Networking Laboratory Dec 2013 – Present
Develop and implement scheduling algorithms for resource-efficient mobile video streaming, which minimize the weighted sum of cellular cost and energy consumption. Model the scheduling problem as a Markov decision process and propose an optimal scheduling algorithm based on dynamic programming. Implement streaming algorithm on an Android platform, and experimentally verify that the model saves 59% of cellular cost and 41% of energy compared to an existing mobile streaming technique which is used by YouTube.

WORK EXPERIENCE

Moloco, Palo Alto, California, USA
Student Internship, Research & Development Division Oct 2014 – Jan 2015
Implement a maximum-likelihood estimation model of the number of users who download a specific mobile application. Make an online probabilistic model visualization from the large-scale crawled database by optimizing SQL queries and building a memory based cache system.

NAVER LABS, Seongnam, Gyeonggi-do, South Korea
Creative Research Program Internship Jul 2014 – Aug 2014
Build a Cloud Comment Hosting Service which is similar to Disqus using Django as a backend and Angular.js as a frontend framework. Got a 2014 Excellence Award, which was given to only 3 selected interns for every summer and winter vacation.

OTHER HONORS & AWARDS

Asia student Supercomputing Challenge 13, Finalist Jan 2013
One of 10 teams among 43 teams selected through the preliminary contest. Utilize a cluster, which is composed of 6 different nodes with Intel Xeon processors and Intel Xeon Phi coprocessor.

Holyshield Hacking Contest 2013, 1st place, Catholic University of Korea Nov 2013
Awarded by the President of Catholic University of Korea. Received an award of $1,000.

Korea Whitehat Hacking Contest 2014, Finalist Nov 2014
Held by Ministry of National Defense and National Intelligence Service 5th place at preliminary contest.

Student Outstanding Contribution Award 2014, UNIST Dec 2014
Awarded by the President of UNIST due to honor UNIST by achieving an competitive result from Student Cluster Challenge at International Supercomputing Conference 2014.

Student Outstanding Contribution Award 2013, UNIST Jan 2014
Awarded by the President of UNIST due to honor UNIST by achieving an competitive result from Korea Whitehat Hacking Contest 2013.

UNIST 2014 Venturing Project Program, Finalist Dec 2014
Technology startup with Korean Sentiment Analyzer. Received $10,000 a support fund.

SCHOLARSHIPS

Global Scholarship for Undergraduate Research Opportunities Program, UNIST 2015
Received $3,000 as a financial support for research internship at Lawrence Berkeley National Laboratory.

Academic Performance Scholarship, UNIST 2011 – 2015

National Science and Engineering Scholarship, Korean Student Aid Foundation 2013

INVITED TALKS

Pycon Korea 2015, Pycon Korea 2015
Easily written Machine Learning

D2 Campus Seminar, NAVER 2014
Python in 140 minutes

CAMPUS ACTIVITIES

HeXA, Computer Security Club, UNIST
President Aug 2012 – Mar 2013
Lead and encourage club members to overcome the lack of experience and knowledge about computer security and the short history of the club, which was not yet 1 years old. Beginning from the first participation of a hacking competition in December 2012, lead more than 10 different hacking competitions and improve the club as a national competitive security club. Find a login vulnerability of YES24 (Korean online shopping mall) and critical vulnerability of electronic attendance systems in UNIST.

DEVELOPMENT EXPERIENCE

+) All links for codes and online demo of bellow projects : http://carpedm20.github.io/

Poet neural, Probabilistic Artificial Intelligence Lab — Jun 2015
Artificial poet born from multi-layer LSTM for character-level language models.

ReviewDuk, Probabilistic Artificial Intelligence Lab — Sep 2014
Korean sentiment analyzer in morphologically rich languages.

Ausung, Probabilistic Artificial Intelligence Lab — May 2015
A Data Visualization of Media Sentiments with Korean Sementic Analyzer.

FoodClassifier, Probabilistic Artificial Intelligence Lab — Sep 2014
Food Image Recognition: Combination of Deep Convolutional Features and Shallow Encoded Features.

VoxOffice & VoxMusic, Data Visualization — Jan 2015
A Streamgraph Data Visualization of Film Box Office and Music Chart Ranking.

All About Critics, Data Visualization — Sep 2014
A Novel Aproach to Compare The Pattern of Critics and Users.

pyLINE, Reverse Engineering — Aug 2014
Reverse engineering of LINE message protocol and build a Python library.

between, Reverse Engineering — Aug 2014
Reverse engineering of Between message protocol and build a Python library.

korail2, Reverse Engineering — Aug 2014
Reverse engineering of Korail protocol and build a Python library.

pyNdrive, Reverse Engineering — Jan 2014
Reverse engineering of Ndrive protocol and build a Python library.

kakao, Reverse Engineering — Aug 2013
Reverse engineering of KakaoTalk message protocol and build a Python library.

MovieTag, Big Data — Sep 2014
Movie search engine based on tags, which are automatically generated from movie reviews.

Emoji, Python Library — Aug 2014
A Python LINE library.

UNIST Portal Bot, Facebook Robot — Aug 2013
Notify every announcement of UNIST via Facebook. 1258 users (1 of 3 UNIST students used).

Let's Work CS, Facebook Robot — Dec 2013
Notify daily recruit information for computer engineering students via Facebook. 1016 users.

15 minutes Before Lunch, Facebook Robot — May 2014
Notify daily school restaurant menu via Facebook. 891 users (1 of 4 UNIST students used).

MovieDuk, Web Service — Dec 2013
Internet Movie Database for Korean film fans. Built with Django.

UNIST Bus When?, Chrome extension — Jun 2014
Notify the time left before a Bus come to UNIST. 109 users at UNIST.

OPEN SOURCE CONTRIBUTION

pinpoint, NAVER — Apr 2015
Application Performance Management tool for large-scale distributed systems. Minor contribution **#318**

yaksok — Apr 2015
Korean programming language. Minor contribution **#3**

LANGUAGES

English: Fluent (speaking, reading, writing). All courses for 4 years are taught in English at UNIST.
Korean: Native language.

SKILLS

Python, MATLAB, JavaScript, Go, Lua, C++, Java, C#