

# 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.

## RESEARCH EXPERIENCE

**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.

<b>WORK EXPERIENCE</b>	<b>Moloco</b> , Palo Alto, California, USA Student Internship, Research & Development Division 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. Oct 2014 – Jan 2015
	<b>NAVER LABS</b> , Seongnam, Gyeonggi-do, South Korea Creative Research Program Internship 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. Jul 2014 – Aug 2014
<b>OTHER HONORS &amp; AWARDS</b>	<b>Asia student Supercomputing Challenge 13</b> , Finalist 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. Jan 2013
	<b>Holyshield Hacking Contest 2013</b> , 1st place, Catholic University of Korea Awarded by the President of Catholic University of Korea. Nov 2013
	<b>Korea Whitehat Hacking Contest 2014</b> , Finalist Ministry of National Defense and National Intelligence Service 5th place at preliminary contest. Nov 2014
	<b>Student Outstanding Contribution Award 2014</b> , UNIST Awarded by the President of UNIST due to honor UNIST by achieving an competitive result from Student Cluster Challenge at International Supercomputing Conference 2014. Dec 2014
	<b>Student Outstanding Contribution Award 2013</b> , UNIST Awarded by the President of UNIST due to honor UNIST by achieving an competitive result from Korea Whitehat Hacking Contest 2013. Jan 2014
	<b>UNIST 2014 Venturing Project Program</b> , Finalist Technology startup with Korean Sentiment Analyzer. Received \$10,000 a support fund. Dec 2014
<b>SCHOLARSHIPS</b>	<b>Global Scholarship for Undergraduate Research Opportunities Program</b> , UNIST Received \$3,000 as a financial support for research internship at Lawrence Berkeley National Laboratory. 2015
	<b>Academic Performance Scholarship</b> , UNIST 2011 – 2015
	<b>National Science and Engineering Scholarship</b> , Korean Student Aid Foundation 2013
<b>CAMPUS ACTIVITIES</b>	<b>HeXA, Computer Security Club</b> , UNIST President 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. Aug 2012 – Mar 2013
<b>DEVELOPMENT EXPERIENCE</b>	+) All links for codes and online demo of bellow projects : <a href="http://carpedm20.github.io/">http://carpedm20.github.io/</a>
	<b>Poet neural</b> , Probabilistic Artificial Intelligence Lab Artificial poet born from multi-layer LSTM for character-level language models. Jun 2015
	<b>ReviewDuk</b> , Probabilistic Artificial Intelligence Lab Korean sentiment analyzer in morphologically rich languages. Sep 2014
	<b>Ausung</b> , Probabilistic Artificial Intelligence Lab A Data Visualization of Media Sentiments with Korean Sementic Analyzer. May 2015
	<b>FoodClassifier</b> , Probabilistic Artificial Intelligence Lab Food Image Recognition: Combination of Deep Convolutional Features and Shallow Encoded Features. Sep 2014
	<b>VoxOffice &amp; VoxMusic</b> , Data Visualization A Streamgraph Data Visualization of Film Box Office and Music Chart Ranking. Jan 2015

	<b>All About Critics</b> , Data Visualization A Novel Approach to Compare The Pattern of Critics and Users.	Sep 2014
	<b>pyLINE</b> , Reverse Engineering Reverse engineering of LINE message protocol and build a Python library.	Aug 2014
	<b>between</b> , Reverse Engineering Reverse engineering of Between message protocol and build a Python library.	Aug 2014
	<b>korail2</b> , Reverse Engineering Reverse engineering of Korail protocol and build a Python library.	Aug 2014
	<b>pyNdrive</b> , Reverse Engineering Reverse engineering of Ndrive protocol and build a Python library.	Jan 2014
	<b>kakao</b> , Reverse Engineering Reverse engineering of KakaoTalk message protocol and build a Python library.	Aug 2013
	<b>MovieTag</b> , Big Data Movie search engine based on tags, which are automatically generated from movie reviews.	Sep 2014
	<b>Emoji</b> , Python Library A Python LINE library.	Aug 2014
	<b>UNIST Portal Bot</b> , Facebook Robot Notify every announcement of UNIST via Facebook. 1258 users (1 of 3 UNIST students used).	Aug 2013
	<b>Let's Work CS</b> , Facebook Robot Notify daily recruit information for computer engineering students via Facebook. 1016 users.	Dec 2013
	<b>15 minutes Before Lunch</b> , Facebook Robot Notify daily school restaurant menu via Facebook. 891 users (1 of 4 UNIST students used).	May 2014
	<b>UNIST FedEx</b> , Facebook Robot Notify anonymous message of UNIST students via Facebook. 785 users (1 of 4 UNIST students used).	May 2014
	<b>MovieDuk</b> , Web Service Internet Movie Database for Korean film fans. Built with Django.	Dec 2013
	<b>UNIST Bus When?</b> , Chrome extension Notify the time left before a Bus come to UNIST. 109 users at UNIST.	Jun 2014
<b>OPEN SOURCE CONTRIBUTION</b>	<b>pinpoint</b> , NAVER Application Performance Management tool for large-scale distributed systems. Minor contribution #318	Apr 2015
	<b>yaksok</b> Korean programming language. Minor contribution #3	Apr 2015
<b>LANGUAGES</b>	English: Fluent (speaking, reading, writing). All courses for 4 years are taught in English at UNIST. Korean: Native language.	
<b>SKILLS</b>	Python, MATLAB, JavaScript, Go, C++, Java, C#	