PH.D. JEMIN LEE

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Interactive Computing Laboratory ◇ Dept. of Knowledge Service Engineering
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RESEARCH INTEREST

Applied Machine Learning
Interruptibility Management in Multiple Mobile Devices
Optimizing Deep Neural Networks for Embedded Systems

Mobile System
Automated Power Model Generation for Smartphones
Energy Optimization for Smartwatches

Software Testing
Large-Scale GUI Testing for Android Applications
Abnormal Resource Usage Detection

WORK EXPEREINCES

Interactive Computing Laboratory, KAIST Daejeon, Korea
Post-doctoral Researcher (including compulsory military service period) Nov. 2017 – Present
Superviosr: Uichin Lee

EDUCATION

Chungnam National University *Sept. 2011 – Aug. 2017*
Ph.D. in Department: Computer Science and Engineering GPA 4.375/4.5
Thesis: Power Modeling, Analysis, and Optimization for Mobile Devices
Advisor: Hyungshin Kim
Outstanding Ph.D. Thesis Award (top 1 out of 115)

Chungnam National University *Mar. 2006 – Aug. 2011*
B.S. in Department: Computer Science and Engineering GPA 3.326/4.5

RESEARCH EXPERIENCES

SuggestBot: Development of a context-based smart interaction service platform Period: Sept. 2017 – Present
Research Assistant *Grant: 750,000,000 KRW (per year)*

- To train SuggestBot core engines and enabling context-based association/suggestion applications, this sub-project aims at collecting conversation-based interaction and context big data as well as mobile/wearable sensor and interaction big data. We develop (1) novel crowdsourcing techniques and open crowdsourcing platforms for conversational interaction and context data annotation; and (2) mobile/wearable sensor and interaction data collection SW (e.g., bio signals, wearable/mobile interaction data, speech data, image/environment/context information).
- This project is funded by national research foundation of Korea.
- Related Papers:
- Demo Videos:

Mobile context sensing platform study using smart gadgets Period: Nov. 2014 – Apr. 2017
Research Assistant *Grant: 39,000,000 KRW (per year)*

· This research project aims to develop a software platform that supports continuous sensing of mobile context information from a smartphone and a wearable device. It is possible to extract more accurate and complicated context information by using a wearable device such as a smart watch recently emerged. The continuous sensing for extracting context information can become energy efficient through data fusion and inference. With the extracted context information, we can optimize conventional OS services like the scheduler and memory manager.
· This project is funded by national research foundation of Korea.
· Related Papers: **[R.1][C.5]**
· Demo Videos:

The Development of Core Technologies for Zone-based Services using Beacons Period: Oct. 2014 – Sep. 2017
Research Assistant *Grant: 150,000,000 KRW (per year)*

· This research aims to develop room-level activity detection in business areas such as shop, office, and home using BLE-Beacon as a next-generation indoor location based service. The proposed method includes heterogeneous data communication, Beacon authentication, and occupant detection.
· This project is funded by national research foundation of Korea.
· Demo Videos: [1]

Energy Analysis and Optimization for Smartphone Period: April 2011 – May 2014
Research Assistant *Grant: 40,000,000 KRW (per year)*

· Since the smartphone users are dramatically increasing, efforts to reduce power consumption and extend the phone lifetime are becoming more important. To reduce energy consumption, it is necessary to analyze application's power consumption in fine grain. A power profiler is the tool for the purpose. Though, until now mobile applications have been developed without supports from the tool, in near future, applications with low energy efficiency will not be selected by users. In this research, we study methods to optimize power consumption of smartphone applications.
· This project is funded by national research foundation of Korea.
· Related Papers: **[J.3][J.2][J.1][C.4][C.3][C.2][C.1]**
· Demo Videos: [1], [2], [3], [4]

PUBLICATIONS

International Journal

· **J.4** Reducing Smartwatch Users' Distraction with Convolutional Neural Network
Jemin Lee, Jinse Kwon, Hyungshin Kim
(SCIE) Mobile Information Systems, vol. 2018, Article ID 7689549, 9 pages, 15 Mar. 2018 (special issue in Advances in Personalized Mobile Services).
(SCIE, impact factor: 0.849)

· **J.3** QDroid: Mobile Application Quality Analyzer for App Market Curators
Jemin Lee, Hyungshin Kim
Mobile Information Systems, vol. 2016, Article ID 1740129, 11 pages, 10 Oct. 2016.
(SCIE, impact factor: 1.462)

· **J.2** O-Sleep : Output-Oriented Power Saving Mode for Smartphones
Hyunwoo Joe, Jungseok Kim, **Jemin Lee**, Hyungshin Kim
Future Generation Computer Systems-The International Journal of eScience, 6 Jun. 2016, ISSN 0167-739X.
(SCIE, Top 10% (2.430) impact factor in JCR Theory&Methods: Category Rank 11/150)

· **J.1** Automated Power Model Generation Method for Smartphones
Jemin Lee, Hyunwoo Joe, Hyungshin Kim
IEEE Transactions on Consumer Electronics, Vol. 60(2), pp. 190-197, May, 2014.
(SCI, impact factor: 1.045)

International Conference

· **C.9** Analysis of Hardware Resources in Distributed Learning **(poster)**
Sihyeong Park, **Jemin Lee**, Hyungshin Kim
In Proceedings of International Workshop on Highly Efficient Neural Networks Design (co-located with EMSOFT), pp. 1-4, Seoul, South Korea, Oct. 2017.

· **C.8** An Ultrasound-based Indoor Localiztion Using Gaussian ASK Modulation **(WIP)**
Jinse Kwon, **Jemin Lee**, Hyungshin Kim
In Proceedings of International Conference on Indoor Positioning and Indoor Navigation, pp. 1-4, Sapporo, Japan, 18-21 Sept. 2017.

· **C.7** Deep Learning Training on Distributed Embedded Systems **(poster)**
Sihyeong Park, **Jemin Lee**, Hyungshin Kim
In Proceedings of the 12th lEMEK Symposium on Embedded Technology, Busan, South Korea, 18-19 May, 2017.

· **C.6** Extending App Pre-Launch Service with Emotion Context **(poster)**
Jinyoung Choi, **Jemin Lee**, Hyungshin Kim
In Proceedings of the 2nd ACM/IEEE International Conference on Internet-of-Things Design and Implementation (IoTDI'17) Adjunct, pp. 1-2, Pittsburgh, USA, 18-21 Apr. 2017.

· **C.5** Reducing Distraction of Smartwatch Users with Deep Learning
Jemin Lee, Jinse Kwon, Hyungshin Kim
In Proceedings of the 18th International Conference on Human-Computer Interaction with Mobile Devices and Services (MobileHCI'16) Adjunct pp. 948-953, Florence, Italy, Sept. 2016.

· **C.4** Framework for automated power estimation of Android applications **(poster)**
Jemin Lee, Hyungshin Kim
International conference on Mobile systems, applications, and services (Mobisys'13), Taipei, Taiwan, pp. 541-542, Jun. 2013.

· **C.3** Energy Reservation Service for Smart Phone Application **(poster)**
Vincent Dupre, **Jaymin Lee**, Hyungshin Kim
3rd ACM/SIGOPS Asia-Pacific Workshop on Systems (ApSys'12) Seoul, South Korea 23-24th, July, 2012.

· **C.2** Smart Phone Power Model Generation Using Use Pattern Analysis
Jaymin Lee, Hyunwoo Joe, Hyungshin Kim
IEEE International Conference on Consumer Electronics(ICCE'12) Las Vegas, NV, USA 13th-16th Jan 2012.

· **C.1** Smartphone, where does the power go?
Jaymin Lee, Hyunwoo Joe, Hyungshin Kim
EU Korea Conference on Science and Technology (EKC'11) Paris, France, 21-23th, July 2011.

Research Article (Submitted)

· **R.1** PASS: Reducing Redundant Interactions between a Smartphone and a Smartwatch for Energy Saving
Jemin Lee, Hyungshin Kim
IEEE Transactions on Mobile Computing (major revision).

Domestic Journal

· 스마트폰의 블루투스와 초음파를 이용한 향상된 실내 영역 결정
권진세, **이제민**, 김형신
대한임베디드공학회논문지 제11권 제3호 135-141쪽, 2016년 6월, ISSN 1975-5066, 학진등재지.

· GUI 버그 검출을 위한 블랙박스 기반의 시험
이제민, 김형신,
정보과학회논문지 제41권 제12호 1013-1017쪽, 2014년 12월, ISSN 2383-630X, 학진등재지.

· 스마트폰 응용프로그램 에너지 소모 분석을 위한 프레임워크
이제민, 조현우, 김형신
정보과학회논문지: 컴퓨팅의 실제 및 레터 제18권 제11호 780-784쪽, 2012년 11월, ISSN 1229-7712, 학진등재지.

Domestic Conference

· Total **16**: 4 first-author and 12 co-author
· Full list of domestic papers: https://leejaymin.github.io/publications.html

HONORS AND AWARDS

IEMEK 2017 Best Presentation Award 2017

· Korean Embedded Engineering Conference 2017, Institute of Embedded Engineering of Korea.

Outstanding Ph.D. Thesis Award (top 1 out of 115) 2017

· Chungnam National University.

Embedded System Design Challenge Bronze Award (out of 28 teams) 2017

· Faster R-CNN Optimization for Embedded System, ACM SIGDA KOREA Chapter 2017.

IEMEK 2015 Best Presentation Award 2015

· Korean Embedded Engineering Conference 2015, Institute of Embedded Engineering of Korea.

KSCI 2015 Best Paper Award 2015

· Korea Society of Computer Information 2015, The Korea Society of Computer Information.

KCC 2015 Best Paper Award 2015

· Korea Computer Congress 2015, The Korean Institute of Information Scientists and Engineers.

Participation award 2015

· Graduation Contest 2015, Chungnam National University.

Best Paper Award 2014

· Korea Computer Congress 2014, The Korean Institute of Information Scientists and Engineers.

Best Presentation Award 2012

· Korea Computer Congress 2012, The Korean Institute of Information Scientists and Engineers.

Participation Award 2011

· Creative Work Contest 2011, Department of Computer Science and Engineering, Chungnam National University.

TALKS

Machine Learning to Deep Learning Jan. 2-6, 2017

· CNU-Machine Learning Tutorial for Grad Student, 15 hours, 3 days.
· Slides: [#1], [#2], [#2]
· Github: [URL]

Machine Learning to Deep Learning Apr. 20, 2017

· DNN, CNN, and RNN seminar in WIPS Daejeon (3 hours).
· Slides: [#1]

CERTIFICATIONS

Machine Learning, Stanford University Dec. 2016

· Coursera Verified Certificate: N3CVJAFQN9E5

Practical Machine Learning, Johns Hopkins University Nov. 2015

· Coursera Verified Certificate: QRGYHPC942

R Programming, Johns Hopkins University Aug. 2015

· Coursera Verified Certificate: UP6WE96RNN

Oral Proficiency Interview by Computer (OPIC) Aug. 2016

· Intermediate High (IH)

ISSUED PATENTS

Method and system for expecting users' mood based on status information and biometric information acquired by using user equipment
Granted 06/15/2017, Korea Patent number 10-1749706
Hyungshin Kim, **Jemin Lee**, Jinyoung Choi

Method for Detecting Indoor Zone with Bluetooth and Ultrasound of Smartphone
Granted 05/29/2017, Korea Patent number 10-1742960
Hyungshin Kim, **Jemin Lee**, Jinse Kwon

System and Method for Detecting Beacon
Granted 05/24/2017, Korea Patent number 10-1741406
Hyungshin Kim, **Jemin Lee**, Seula Hwang

Portable terminal and method for controlling a battery charging of the same
Granted 08/16/2016, Korea Patent number 10-1650038000
Hyungshin Kim, **Jemin Lee**, Donggeon Han

Search system and method of executable GUI
Granted 04/20/2015, Korea Patent number 10-1513662000
Hyungshin Kim, **Jemin Lee**, Donggeon Han

Collaborative Power Model Creation Method and Service Module With the Same
Granted 02/26/2013, Korea Patent number 10-12669710000
Hyungshin Kim, **Jemin Lee**

SKILLS

Data Science	R, Python (including TensorFlow)
Mobile and Embedded Systems	C, Linux, Java (including Android), ARM-assembly
Others	NodeJS, JSP, MySQL, LaTex

ACADEMIC SERVICES

External Reviewer

· Pervasive and Mobile Computing 2014.
· IEEE Transactions on Mobile Computing 2015.
· Journal of Medical Internet Research 2018.
· Sustainable Computing, Informatics and Systems 2018.

TEACHING EXPERIENCES

Multimedia Spring, 2013, 2014 (two times)

· Teaching Assistance for Programming Practice in Chungnam National Univ.

Embedded System Spring, 2012 (one time)

· Teaching Assistance for Programing Practice in Chungnam National Univ.

System Programing Fall. 2011, 2012, 2014 (three times)

· Teaching Assistance for Programming Practice in Chungnam National Univ.

REFERENCES

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