# Hyunsung Cho

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## RESEARCH INTERESTS

Ubiquitous computing, context-aware computing, human-computer interaction, social computing

## HIGHLIGHTS

- Research experience and publications in ubiquitous computing and mobile HCI [c.1-3][p.1-3]
- Research experience in multi-modal sensing (audio, motion) and machine learning [c.2][p.1][p.2]
- Experience in machine learning applications [c.2][t.1-5]
- Strong acoustic signal processing skills [c.2][p.1][p.2][t.2][t.3][t.5]
- Basic embedded SW and hardware prototyping skills [t.1]

## EDUCATION

**Korea Advanced Institute of Science and Technology (KAIST)** *Mar. 2020 -*
Ph.D. in Computer Science
Networking & Mobile Systems Lab. Advisor: Sung-Ju Lee

**Korea Advanced Institute of Science and Technology (KAIST)** *Mar. 2018 - Feb. 2020*
M.S. in Computer Science
Networking & Mobile Systems Lab. Advisor: Sung-Ju Lee

**Korea Advanced Institute of Science and Technology (KAIST)** *Aug. 2013 - Feb. 2018*
B.S. in Computer Science (Software Advanced Major)
*Magna Cum Laude*

## PUBLICATIONS

### Conference & Journal Papers

[c.2] Knocker: Vibroacoustic-based Object Recognition with Smartphones.
Taesik Gong, **Hyunsung Cho**, Bowon Lee, and Sung-Ju Lee.
*UbiComp 2019: ACM Annual Conference on Interactive, Mobile, and Ubiquitous Technologies*

[c.1] Intelligent Positive Computing with Mobile, Wearable, and IoT Devices: Literature Review and Research Directions.
Uichin Lee, Kyungsik Han, **Hyunsung Cho**, Kyong-Mee Chung, Hwajung Hong, Sung-Ju Lee, Youngtae Noh, Sooyoung Park, and John M. Caroll.
*Ad Hoc Neworks Journal, Voulme 83, 2019*

### Posters, Demos, and Workshop Papers

[p.3] Sender-Controlled Mobile Instant Message Notifications Using Activity Information.
**Hyunsung Cho**, Jinyoung Oh, Juho Kim, and Sung-Ju Lee.
*MobiSys 2019 Demos: ACM International Conference on Mobile Systems, Applications and Services*

[p.2] Real-Time Object Identification with a Smartphone Knock.
Taesik Gong, **Hyunsung Cho**, Bowon Lee, and Sung-Ju Lee.
*MobiSys 2019 Videos: ACM International Conference on Mobile Systems, Applications and Services*
**Best Video Award**

[p.1] Identifying Everyday Objects with a Smartphone Knock.
Taesik Gong, **Hyunsung Cho**, Bowon Lee, and Sung-Ju Lee.
*CHI 2018 Extended Abstract: ACM Conference on Human Factors in Computing Systems*

## WORK EXPERIENCE

**KAIST Networking and Mobile Systems Lab (NMSL),** Daejeon, South Korea *Mar. 2017 - Present*
*Research Assistant*
Advisor: Sung-Ju Lee. Research on novel applications of mobile sensing for context-aware services.

**Kiswe Mobile Inc.,** New Providence, NJ, USA *Jun. 2017 - Aug. 2017*
*Web Frontend Developer*
Developed a trivia widget for interactive mobile sports streaming service. The widget was included in the live service for the IAAF Diamond League event in collaboration with VRT Sporza. The service was covered in press. Developed tools to support video streamers such as a multi-view layout editor for multi-cam videos; an easy drag-and-drop thumbnail uploader; and a live streaming control interface.

**KAIST Interaction Lab (KIXLAB),** Daejeon, South Korea *Dec. 2015 - Feb. 2017*
*Research Intern*
Advisers: Jihee Kim and Juho Kim. Research on analysis of presidential election promises in relation with government budget expenditure data through crowdsourcing.

## COURSE PROJECTS

**GCT634 Musical Applications of Machine Learning**

[t.5] **Bass Instrument Source Separation**
Developed a convolutional autoencoder-based bass instrument source separation model to extract bass sound from a multi-instrument music source [report] [github]

[t.4] **Music Generation**
Developed an RNN model that generates musical note sequences [github]

[t.3] **Music Genre Classification**
Developed a CNN model to classify audio files into different music genres [report] [github]

[t.2] **Musical Instrument Classification**
Developed a machine learning model to classify audio files into different music instruments using multiple audio features [report] [github]

**KSE624 Mobile and Pervasive Computing**

[t.1] **Smart Shoes for Bouncing Leg Detection**
Designed and built e-textile based smart shoes that detect whether the shoe wearer is bouncing a leg or not [ppt] [github]

## AWARDS & HONORS

**Best TA Award** *2019*
KAIST School of Computing

**Google Women Techmakers Scholars** *2019*
$1K Academic scholarship, awarded based on academic performance, leadership, and impact on the community of women in tech

**Best Video Award** *2019*
MobiSys 2019 [p.2]

**Best Poster/Demo Award** *2018*
ACM SIGCHI Local Chapter [p.1]

**Undergraduate Research Program** *2016*
$2K Research grant awarded by KAIST

**2nd Place, The 3rd Korea SW Hackathon** *2016*
$3K Award by the Ministry of Science, ICT and Future Planning of Republic of Korea

**National Science & Technology Scholarship** *2014 - 2017*
Merit-based scholarships

## TEACHING EXPERIENCE

**Head Teaching Assistant**, KAIST *Spring 2019*
CS341 Introduction to Computer Networks

**Invited Student Panel**, KAIST *Spring 2019*
CS492 Introduction to Research (invited by Juho Kim, Sung-Ju Lee, and Shin Yoo)

**Teaching Assistant**, KAIST *Fall 2018*
CS341 Introduction to Computer Networks

**Teaching Assistant**, KAIST *Fall 2016 - Fall 2017*
CS101 Introduction to Programming

## INVITED TALKS

**Vibroacoustic-based Object Recognition with Smartphones**
2019 IAT (Information Accessibility Technology) Conference Nov. 22, 2019

## EXTRACURRICULAR EXPERIENCE

**MADCAMP (Mobile Application Development Camp)** *Dec. 2016 - Feb. 2017*
Intensive, focused development camp where I developed five different mobile applications in 4.5 weeks. Example apps are a humming-based multi-play music quiz game and a group alarm clock that ensures every member to wake up.

**SPARCS (Developers Club), KAIST** *Mar. 2014 - Dec. 2016*
*Head of Server Management Group & Web Developer*
Managed over 10 physical and virtual server machines as the leader of the club's server management group. Developed a server monitoring tool using gRPC. Held seminars on the basics of server management for students. Topics include Linux, LDAP, mail server, file system, and security.

## SELECTED PRESS

**Electronics Weekly**, Sensor fusion lets phone identify objects by simply knocking against them *Oct. 2019*

**Science Daily**, Object identification and interaction with a smartphone knock *Oct. 2019*

**NEW ATLAS**, Smartphone tech recognizes objects by being knocked against them *Oct. 2019*

**Nerdiest**, This algorithm makes smartphones recognize objects just by Knocking them *Apr. 2018*

**ICT NEWS**, New application allows you to identify an object by tapping it with a smartphone *Apr. 2018*

**Sporza**, Sporza biedt interactieve primeur met Kiswe Mobile tijdens Diamond League Brussel *Aug. 2017*

## TECHNICAL STRENGTHS

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|---|---|
| **Programming Languages** | Python, Java, Kotlin, Javascript, C++, C, MATLAB |
| **Mobile Development** | Android, React Native |
| **Hardware Prototyping** | Arduino, e-textiles |
| **Backend Development** | Django, Node, Express |
| **Web Frontend Development** | React, Vue.js, AngularJS, jQuery, D3.js, HTML, CSS |
| **Database** | Firebase, MySQL, MongoDB |
| **Tools** | Git/Github, Vim, LaTex, Markdown, Slack |