

DU C BUI

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Have research experience in **user privacy**, **federated learning**, and **mobile systems** that have been published at top-tier conferences. Built end-to-end automated systems and formal models to detect the inconsistencies between privacy policies and actual data collection of mobile apps, websites, and browser extensions. Developed novel energy-saving techniques for the Chrome web browser and real-time video streaming with quality-of-service (QoS) guarantees.

EDUCATION

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| University of Michigan , Ann Arbor, MI | Sep 2017 – May 2022 (tentative) |
| • PhD Candidate in Computer Science · Advisor: Professor Kang G. Shin | |
| Korea Advanced Institute of Science and Technology (KAIST) , South Korea | Sep 2011 – Aug 2013 |
| • MSc in Computer Science · GPA 4.0/4.3 (96.7/100) · Outstanding Master's Thesis Award | |
| Hanoi University of Science and Technology , Vietnam | Sep 2005 – Jul 2010 |
| • BSc in Computer Science · GPA 8.5/10 (top 1% of CS Dept.) | |

INDUSTRIAL EXPERIENCE

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| Facebook , Menlo Park, CA | Research Intern | May – Aug 2019 |
| • Personalized Federated Learning: Designed and implemented the 1 st privacy-preserving user representation learning for federated learning. Improved AUC/accuracy of non-personalized models by 8-51% and provided similar performance to centralized approaches while preserving user privacy. Part of my implementation (3000+ lines of code) was open sourced in Facebook PyText. Wrote a paper that was submitted to ICLR 2020 and published on arXiv. [PyTorch, Pandas, Python] | | |
| Google , Mountain View, CA | Software Engineering Intern | May – Aug 2017 |
| • Chrome performance metrics: Implemented congestion tracking metrics to the Chrome web browser to quantify page load times and responsiveness of foreground tabs when a browser loads multiple tabs simultaneously. Made 16 code changes (added 3000+ and deleted 500+ lines of code) to the Chrome codebase. The metrics were deployed in production. [C++] | | |
| Samsung , Suwon, South Korea | Research Intern | May – Sep 2015 |
| • Mobile cross-device resource sharing: Improved cross-phone camera preview frame rate by 6X and photo-capturing time by 4X, compared to the state of the art (Rio, MobiSys 2014) by using real-time streaming protocols (RTSP/RTCP/RTP). Developed a unified resource management framework with 11,000+ lines of C/C++ code that manages camera, sensors, and apps across multiple heterogeneous-platform mobile devices. [C, C++, CMake, Tizen OS] | | |
| Microsoft Research , Beijing, China | Research Intern | Jan – Jun 2014 |
| • Energy-efficient mobile web browsing: Reduced the whole-system energy consumption of the Google Chrome mobile web browser by 24.4% with no perceivable impact on page load time. Analyzed inefficiencies of browser internals (process/thread structure, resource fetcher, and renderer) and leveraged the heterogeneous multi-core big.LITTLE CPU architecture to develop energy-saving techniques for the Chrome and Firefox web browsers on Android. Resulted in a paper published in a top-tier conference and highlighted on an ACM SIGMOBILE magazine & online news. [C++, Python, Android] | | |

ACADEMIC EXPERIENCE

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| University of Michigan , Ann Arbor, MI | Research Assistant | Sep 2017 – present |
| • PhD thesis research - Assessment of privacy risks in mobile and web applications/services: Developed five End-to-End (E2E) systems to automatically assess the privacy risks of mobile and web apps through the analysis of privacy policies, app execution and user interfaces. Analyzed the flow-to-policy consistency between the privacy statements in privacy policies and the actual data flows of mobile apps, websites, and browser extensions. Detected the inconsistencies between the opt-out settings and their enforcement of websites and online trackers. Analyzed website privacy policies to provide an easy-to-understand presentation that helps users beware of the practices performed on their data. [Dynamic analysis, NLP, formal modeling, user study] | | |
| • Two projects were published and the other three are under review of top-tier conferences (CCS, USENIX and S&P). | | |
| KAIST , Daejeon, South Korea | Research Assistant | Sep 2011 – Jun 2017 |
| • Energy-efficient multi-link real-time streaming: Designed and implemented the 1 st LTE-enabled prototype that aggregates bandwidth over multiple asymmetric mobile wireless interfaces (WiFi & LTE) for energy-efficient real-time delivery. Provided quality-of-service (QoS) for high-bitrate video streaming while reducing energy consumption by leveraging Radio Resource Control (RCC) states of LTE. This work was published in a top-tier conference. [C, Java, Android] | | |

SELECTED PUBLICATIONS

1. *Consistency Analysis of Data-Usage Purposes in Mobile Apps*.
Duc Bui, Yuan Yao, Kang G. Shin, Jong-Min Choi, and Junbum Shin.
ACM SIGSAC Conference on Computer and Communications Security (**CCS**), 2021. (**22%** acceptance rate)
2. *Automated Extraction and Presentation of Data Practices in Privacy Policies*.
Duc Bui, Kang G. Shin, Jong-Min Choi, and Junbum Shin.
Privacy Enhancing Technologies Symposium (**PETS**), 2021. (**21%** acceptance rate)
3. *Federated User Representation Learning*.
Duc Bui, Kshitiz Malik, Jack Goetz, Honglei Liu, Seungwhan Moon, Anuj Kumar, and Kang G. Shin.
arXiv:1909.12535 [cs.LG], 2019.
4. *Active Federated Learning*.
Jack Goetz, Kshitiz Malik, **Duc Bui**, Seungwhan Moon, Honglei Liu, and Anuj Kumar.
Workshop on Federated Learning for Data Privacy and Confidentiality (in Conjunction with **NeurIPS**), 2019.
5. *Rethinking Energy-Performance Trade-Off in Mobile Web Page Loading*.
Duc Bui, Yunxin Liu, Hyosu Kim, Insik Shin, and Feng Zhao.
ACM International Conference on Mobile Computing and Networking (**MobiCom**), 2015. (**18%** acceptance rate)
6. *GreenBag: Energy-efficient Bandwidth Aggregation for Real-time Streaming in Heterogeneous Mobile Wireless Networks*.
Duc Bui, Kilho Lee, Sangeun Oh, Hyojeong Shin, Insik Shin, Honguk Woo, and Daehyun Ban.
IEEE Real-Time Systems Symposium (**RTSS**), 2013. (**22%** acceptance rate)

OTHER PUBLICATIONS

1. *Cross-Platform Support for Rapid Development of Mobile Acoustic Sensing Applications*.
Yu-Chih Tung, **Duc Bui**, and Kang G. Shin.
ACM International Conference on Mobile Systems, Applications and Services (**MobiSys**), 2018.
2. *Mobile Plus: Mobile platform for Transparent Sharing of Functionalities Across Devices*.
Sangeun Oh, Hyuck Yoo, Dae R. Jeong, **Duc Bui**, and Insik Shin.
ACM International Conference on Mobile Systems, Applications and Services (**MobiSys**), 2017.
3. *Demo: Mobile Plus: Mobile platform for Transparent Sharing of Functionalities Across Devices*.
Sangeun Oh, Hyuck Yoo, Daelyong Jeong, Sooyoung Park, **Duc Bui**, Sungsoo Moon, and Insik Shin.
ACM International Conference on Mobile Systems, Applications and Services (**MobiSys**), 2016.
4. *Rethinking Energy-Performance Trade-Off in Mobile Web Page Loading*.
Duc Bui, Yunxin Liu, Hyosu Kim, Insik Shin, and Feng Zhao.
ACM SIGMOBILE GetMobile Magazine (Research highlights), 2016.
5. *A Case Study of the Application of Dynamic Symbolic Execution to Real-World Binary Programs*.
Duc Bui, Yunho Kim, and Moonzoo Kim.
Korea Conference on Software Engineering (KCSE), 2012.
6. *A method of verifying web service composition*.
Thang Huynh, Quynh Pham, and **Duc Bui**.
ACM International Symposium on Information and Communication Technology (SoICT), 2010.

HONORS AND AWARDS

- 2016 **Naver PhD Fellowship** by Naver Corp. (the largest search engine in South Korea) for excellent PhD students.
- 2015 **Qualcomm Innovation Award** finalist, being in the top 10 out of the 37 final-round projects.
- 2015 **Microsoft Research Asia Fellowship Nomination Award**, being one of 90 students selected from top Asia universities.
- 2014 **Microsoft Research Asia Excellent Award** in the Stars of Tomorrow Internship Program.
- 2014 **Outstanding Master's Thesis Award** by Computer Science Department, KAIST.
- 2010 **Korean Government Scholarship** for the master's program at KAIST.
- 2009 **Vietnam Ministry of Information and Communications Scholarship** for outstanding students.