

Mian WAN

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I am a Ph.D. candidate in the Department of Computer Science at the University of Southern California. My research interests cover the areas of software testing, program analysis, and program optimization. My Ph.D. research work focuses on automatically detecting and optimizing energy consuming UIs in mobile applications using static and dynamic analysis techniques.

EDUCATION

- 2013 – 2020 (EXPECTED) **Ph.D. Candidate** in Computer Science, University of Southern California, Los Angeles, USA
Advisor : Prof. [William G. J. Halfond](#)
Thesis : Automatic Detection and Optimization of Energy Consuming UIs in Android Applications
- 2010 – 2013 **Master of Engineering**, in Software Engineering, Peking University, Beijing, China
Advisor : Prof. Sihan Qing, [Qingni Shen](#)
GPA : 3.95/4.0
- 2006 – 2010 **Bachelor of Engineering**, in Information Security, Yunnan University, Kunming, China

RESEARCH EXPERIENCE

- University of Southern California Los Angeles
Research Assistant SEP 2013 – PRESENT
- A TECHNIQUE TO OPTIMIZE DISPLAY ENERGY CONSUMPTION OF MOBILE APPS** JUNE 2019 – PRESENT
Display is one of the most power hungry components, and one potential solution is to apply an energy-efficient color scheme to the app. To do this, I designed a technique to automatically generate and apply an energy efficient color design to an app.
- A STATIC ANALYSIS BASED TECHNIQUE TO MODEL LAYOUT AND STYLE INFORMATION OF ANDROID GUIS** SEP 2017 – OCT 2019
The layout and style information of mobile GUIs are the basis of many quality assurance techniques, such as test generation. I designed a new static analysis based approach for analyzing an app and identifying information about its GUI's appearance.
- AN EMPIRICAL STUDY OF ANDROID APPS' UI IMPLEMENTATIONS** FEB 2019 – JULY 2019
Mobile apps' UI implementations have changed significantly due to the availability of new APIs and mechanisms. I studied a large set of real-world apps to identify developers' coding practice changes and implications for current testing techniques.
- A TOOL TO DETECT DISPLAY ENERGY HOTSPOTS IN ANDROID APPS** SEP 2013 – MAR 2017
Display is one of the most power hungry components, and developers lack techniques to identify the display energy hotspots – UIs whose energy can be optimized. I designed a technique to detect those hotspots and prioritize them for developers.
- A STUDY OF CODE OBFUSCATION IMPACT ON ENERGY USAGE** NOV 2014 – OCT 2015
Code obfuscation is widely used to prevent software privacy. To know its impact to battery life and help developers make choices, I collected energy consumption data for different obfuscated versions of Android apps on two mobile phones.

PUBLICATIONS

- [9] **Mian Wan**, Ali Alotaibi, and William G. J. Halfond. Optimizing Display Energy for Android GUIs. In *Preparation*.
- [8] **Mian Wan**, Negarsadat Abolhassani, Ali Alotaibi, and William G. J. Halfond. An Empirical Study of UI Implementations in Android Applications. In *2019 IEEE International Conference on Software Maintenance and Evolution (ICSME)*, pages 65–75, Sep. 2019.
- [7] Yingjun Lyu, Jiaping Gui, **Mian Wan**, and William G. J. Halfond. An Empirical Study of Local Database Usage in Android Applications. In *2017 IEEE International Conference on Software Maintenance and Evolution (ICSME)*, pages 444–455, Sep. 2017.
- [6] **Mian Wan**, Yuchen Jin, Ding Li, Jiaping Gui, Sonal Mahajan, and William G. J. Halfond. Detecting display energy hotspots in Android apps. *Software Testing, Verification and Reliability*, 27(6):e1635, 2017. e1635 stvr.1635.
- [5] Jiaping Gui, Ding Li, **Mian Wan**, and William G. J. Halfond. Lightweight Measurement and Estimation of Mobile Ad Energy Consumption. In *Proceedings of the 5th International Workshop on Green and Sustainable Software, GREENS '16*, pages 1–7, New York, NY, USA, 2016. ACM.
- [4] Cagri Sahin, **Mian Wan**, Philip Tornquist, Ryan McKenna, Zachary Pearson, William G. J. Halfond, and James Clause. How does code obfuscation impact energy usage? *Journal of Software : Evolution and Process*, 2016.

- [3] Ding Li, Yingjun Lyu, **Mian Wan**, and William G. J. Halfond. String Analysis for Java and Android Applications. In *Proceedings of the 2015 10th Joint Meeting on Foundations of Software Engineering*, pages 661–672, New York, NY, USA, 2015.
- [2] **Mian Wan**, Yuchen Jin, Ding Li, and William G. J. Halfond. Detecting Display Energy Hotspots in Android Apps. In *2015 IEEE 8th International Conference on Software Testing, Verification and Validation (ICST)*, pages 1–10, April 2015.
- [1] Qingni Shen, **Mian Wan**, Zhuangzhuang Zhang, Zhi Zhang, Sihan Qing, and Zhonghai Wu. A Covert Channel Using Event Channel State on Xen Hypervisor. In *Information and Communications Security*, pages 125–134. Springer International Publishing, April 2013.

PATENTS

- Qingni Shen, **Mian Wan**, Zhonghai Wu, Sihan Qing. “A dynamic client authentication method for mobile cloud”. CN Patent No. ZL201310227082.9. 2016.

PROFESSIONAL SERVICES

Program Committee

- 36th IEEE International Conference on Software Maintenance and Evolution (ICSME), Research Track, 2020

Reviewer for Journals

- IEEE Transactions on Software Engineering (TSE), 2020
- Pervasive and Mobile Computing (PMC), 2020
- Journal of Software : Evolution and Process (JSME), 2018
- Journal of Software : Testing, Verification and Reliability (STVR), 2016

WORK EXPERIENCE

<p>January 2013 September 2011</p>	<p>Research Intern, MOE KEY LAB OF NETWORK AND SOFTWARE ASSURANCE, PEKING UNIVERSITY, China</p> <ul style="list-style-type: none"> ➤ Discovered a new covert channel on Xen hypervisor, which violates the security policy of the virtualization technique used in Cloud Computing ➤ Proposed a dynamic location based user authentication mechanism for mobile cloud clients.
<p>April 2010 November 2009</p>	<p>Software Engineer Intern, BEIJING SOFTWARE EXPORT CENTER, China</p> <ul style="list-style-type: none"> ➤ Worked on the development of the auditing module of a web application called BUAA (Beijing University of Aeronautics & Astronautics) Returned Student Pioneer Park Management System ➤ Involved in the database design for the whole web application

TEACHING EXPERIENCE

<p>August 2019 January 2014</p>	<p>Teaching Assistant, UNIVERSITY OF SOUTHERN CALIFORNIA</p> <ul style="list-style-type: none"> ➤ CSCI 585 : Database Systems, Summer 2019 ➤ CSCI 585 : Database Systems, Summer 2018 ➤ CSCI 585 : Database Systems, Summer 2017 ➤ CSCI 310 : Software Engineering, Spring 2017 ➤ CSCI 455x : Introduction to Programming Systems Design, Fall 2016 ➤ CSCI 455x : Introduction to Programming Systems Design, Summer 2016 ➤ CSCI 310 : Software Engineering, Spring 2016 ➤ CSCI 512 : Testing and Analysis of Software Systems, Fall 2015 ➤ CSCI 571 : Web Technologies, Summer 2015 ➤ CSCI 377 : Introduction to Software Engineering, Spring 2014
<p>December 2012 September 2011</p>	<p>Teaching Assistant, PEKING UNIVERSITY</p> <ul style="list-style-type: none"> ➤ 0AI01 : Introduction of Network and Information Security, Fall 2012 ➤ 0C110 : Linux Kernel Analysis and Drive Programming, Spring 2012 ➤ 0AI01 : Introduction of Network and Information Security, Fall 2011

HONORS AND AWARDS

- 2011 May 4th Scholarship at Peking University
- 2011 Merit Student at Peking University
- 2009 The Second Prize Scholarship at Yunnan University
- 2008 Merit Student at School of Software, Yunnan University
- 2008 The Third Prize Scholarship at Yunnan University
- 2007 The First Prize Scholarship at Yunnan University

SKILLS

Systems Windows, Mac OS, Linux
Programming Language Java, C, C++, Python, SQL, JavaScript, Bash, HTML
Tools Eclipse, IntelliJ, Visual Studio, Subversion, Git, Selenium, Cucumber, Cobertura, JUnit
Advanced Tools Soot, Android ADB based tools (e.g. UI Automator, Monkey)

LANGUAGES

Chinese ● ● ● ● ●
English ● ● ● ● ○

INTERESTS

SPORTS : Badminton, Tennis, Table Tennis
ARTS : Movies, Photography
Misc : Travel