

Open-source hacker and security researcher specializing in web and computer systems. A WebKit, Chromium, and GNOME project contributor. 9 years of industry and 7 years of academic experience. Looking for opportunities in the Web browser, Emerging Web, Browser Security, Web Security & Privacy, and Computer Graphics.

**Skills** WebKit, Blink/Chromium, GNOME, Linux, C/C++, Python, HTML/CSS/Javascript, Objective-C, Java, OpenGL/OpenGL ES, Clutter, Computer Graphics, GTK+, eBPF, BCC, Ethereum, Git, OBS, Clang, LLVM, GStreamer, Tizen, Linux Perf, Bluetooth LE, ReactJS, React Native, Embedded system, Puppeteer

## Education

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|-------------------|--|
| 08/2017 - 12/2022 | <b>Ph.D. student (ABD)</b> in Computer Science, <b>Georgia Institute of Technology, U.S.A.</b>         |
| 08/2017 - 12/2022 | <b>Dual M.S.</b> in Computer Science and Cybersecurity, <b>Georgia Institute of Technology, U.S.A.</b> |
| 03/2000 - 06/2008 | <b>Dual B.E.</b> in Digital Media and Computer Engineering, <b>Ajou University, South Korea</b>        |

## Professional Experience

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|-------------------|--|
| 01/2023 - Present | <b>Sr. Software Engineer at ByteDance/TikTok Ltd.</b> in Mountain View, CA <ul style="list-style-type: none"><li>Working on the Web Platform</li><li>Web Standardization at the W3C Working Groups: CSS, Performance, WebApp Sec, and Privacy</li></ul>  |
| 06/2019 - 12/2022 | <b>Intern at Igalia, S.L.</b> in A Coruña, Spain ( <a href="#">cert.</a> ) <ul style="list-style-type: none"><li>Bring ANGLE backend for WebGL to WebKitGTK</li><li>Zero copy texture sharing between Mesa and ANGLE via Linux DMA buffer</li><li>Research Text-To-Speech technologies to employ for WebKitGTK</li></ul>   |
| 05/2020 - 08/2020 | <b>Intern at Samsung Research America</b> in Mountain View, CA   |
| 05/2019 - 08/2019 | <ul style="list-style-type: none"><li>Build a web app for health data analysis with ReactJS (frontend) and Node.js (backend)</li><li>Built an automated system verifying the UI of a watch app by using the Tizen automation framework</li><li>Profiled memory usage and revealed possible memory leak of a watch app by using Valgrind</li><li>Implemented file transfer via Bluetooth LE in a React Native watch application</li></ul> |
| 08/2012 - 03/2016 | <b>Software engineer at Collabora Ltd.</b> in Cambridge, UK <ul style="list-style-type: none"><li>Developed hardware-based compositing based on Clutter in WebKit</li><li>Resource-efficient web browser based on GNOME Epiphany for Raspberry Pi 2+</li><li>Customized WebKit features and API set for Smart TV Alliance SDK</li></ul>  |
| 07/2008 - 08/2012 | <b>Assistant Software engineer at Samsung Electronics</b> in Suwon, South Korea <ul style="list-style-type: none"><li>Developed an in-house web layout engine for Smart TVs, Printers in C++</li><li>Implemented WebGL and Accelerated Compositing in WebKit EFL by using OpenGL ES for Tizen</li></ul>  |
| 07/2007 - 06/2008 | <b>Intern at Samsung Software Membership</b> in Suwon, South Korea <ul style="list-style-type: none"><li>Developed a 3D racing game using DirectX on Windows (<a href="#">video</a>)</li></ul>   |

## Academic Experience

|                   |  |
|-------------------|--|
| 01/2023 - Present | <b>Instructional Associate at OMSCS, Georgia Tech</b> <ul style="list-style-type: none"><li>CS 6262: Network Security</li></ul>  |
| 05/2021 - 08/2021 | <b>Research Intern at Tandon School of Engineering, New York University</b> <ul style="list-style-type: none"><li>Research an online ad privacy issue</li></ul>  |
| 08/2019 - 05/2021 | <b>Teaching Assistant at the School of Computer Science, Georgia Tech</b> <ul style="list-style-type: none"><li>CS 6262: Network Security, Design, and Implement the XSS task using node.js and Chrome Extension</li><li>CS 6035: Intro to InfoSec</li></ul>   |
| 08/2017 - 05/2022 | <b>Research Assistant at the School of Computer Science, Georgia Tech</b> <ul style="list-style-type: none"><li>Study privacy leakage in online ads</li><li>Redesign chromium to block user tracking by web browser fingerprints</li><li>Debloated Chrome browser with feature sunsetting on the fly by binary rewriting</li><li>Implemented an idle profiler that diagnoses off-CPU time in the multi-threaded programs using HPC</li></ul> |
| 07/2016 - 08/2017 | <b>Research Associate at the School of Computer Science, Georgia Tech</b> <ul style="list-style-type: none"><li>Developed a defense system against micro DDoS by profiling resources with HPC (Intel PCM, MBM)</li></ul>   |

## Open Source Projects

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|-------------------|--|
| 04/2013 - Present | <b>Committer to WebKit</b> ( <a href="#">patches</a> ) <ul style="list-style-type: none"><li>Contribute CSS properties (e.g., font-size-adjust)</li><li>Contribute several web features for WebKitGTK (e.g., Form Validation, Gamepad API with libmanette, AVIF support with dav1d, Web Speech Synthesis with Flite and GStreamer, etc.)</li><li>Implement OpenGL ES backend for Accelerated Compositing.</li><li>Developed memory pressure handler that copes with out-of-memory on top of Linux cgroup.</li><li>Enhance WebGL support and fix layout and rendering issues</li><li>Fix CVE security bugs in WebKit (<a href="#">CVE-2020-10018</a>, <a href="#">CVE-2020-11793</a>)</li></ul> |
| 10/2013 - Present | <b>Member of GNOME Foundation</b> ( <a href="#">patches</a> ) <ul style="list-style-type: none"><li>Translate GNOME Web and its Help document in Korean</li></ul>  |

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|---------------------|---|
| 01/2015 - Present   | <b>Contributor to Chromium/Blink</b> ( <a href="#">patches</a> ) <ul style="list-style-type: none"> <li>• Implemented CSS properties (e.g., font-size-adjust)</li> <li>• Fix many layout and rendering issues in Blink</li> </ul> |
| <b>Publications</b> |   |
| ACSAC 2022          | <a href="#">DeView: Confining Progressive Web Applications by Debloating Web APIs</a> (paper)   |
| ACM CCS 2022        | <a href="#">Cart-ology: Intercepting Targeted Advertising via Ad Network Identity Entanglement</a> (paper)  |
| ACM CCS 2020        | <a href="#">Slimium: Debloating the Chromium Browser with Feature Subsetting</a> (paper)  |
| arXiv:2205.00056    | <a href="#">Mitigating Low-volume DoS Attacks with Data-driven Resource Accounting</a> (paper)  |
| <b>Patents</b>      |   |
| US9524076B2         | <a href="#">Web page management method and apparatus and storage medium thereof</a> (alias Tab Group)   |
| US9378300B2         | <a href="#">Interface method and display device</a> (alias Picture-in-Picture Play)   |
| US20110090165A1     | <a href="#">Interface method and display device</a>   |
| US20110289110A1     | <a href="#">Method of re-searching webpage and apparatus and storage medium therefor</a>  |
| <b>Talks</b>        |   |
| 12/09/2022          | ACSAC 2022 in Austin, TX, U.S.A. ( <a href="#">slides</a> )   |
| 11/09/2022          | ACM CCS 2022 in Los Angeles, CA, U.S.A. ( <a href="#">slides</a> )  |
| 12/07/2014          | Web Engines Hackfest 2014 in A Coruña, Spain ( <a href="#">slides</a> )   |
| 09/29/2014          | DEVIEW 2014 in Seoul, South Korea ( <a href="#">slides</a> , <a href="#">video</a> )  |
| 04/25/2014          | Jeju University in Jeju, South Korea ( <a href="#">slides</a> )   |
| 10/27/2013          | DevOn 2013 in Seoul, South Korea ( <a href="#">slides</a> )   |
| <b>Services</b>     |   |
| 04/2023 - Present   | <a href="#">Representative of ByteDance at W3C Working Groups: CSS, Perf, App Sec, and Privacy</a>  |
| 10/2021             | <a href="#">Mentoring student participants in the Open-source SW Developer Competition, South Korea</a> (citation)  |

*Last update: 05/08/2023*