

Sven Bugiel

SYSTEMS SECURITY RESEARCHER · TENURED FACULTY

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Experience

Faculty (Tenured), Head of Trusted Systems Research Group

since 01/2022

CISPA HELMHOLTZ CENTER FOR INFORMATION SECURITY

Saarbrücken, Germany

- Supervised doctoral and (under-)graduate students in the area of (mobile) platform security with focus on Android, integration of hardware security components into security architectures, and usable security for authentication and access control
- Offered a graduate-level lecture *Mobile Security* and research seminar, both focused on Android security, and a core lecture *Security* covering basics of various aspects of cybersecurity

Faculty (Tenure-Track), Head of Trusted Systems Research Group

07/2018 – 12/2021

CISPA HELMHOLTZ CENTER FOR INFORMATION SECURITY

Saarbrücken, Germany

- Supervised doctoral and (under-)graduate students in the area of (mobile) platform security with focus on Android, integration of hardware security components into security architectures, and usable security for authentication and access control
- Offered a graduate-level lecture *Mobile Security* and research seminar, both focused on Android security

Research Group Leader, Head of Trusted Systems Research Group

05/2016 – 06/2018

CISPA HELMHOLTZ CENTER FOR INFORMATION SECURITY

Saarbrücken, Germany

- Supervised doctoral and (under-)graduate students in the area of Android platform security
- Offered a graduate-level lecture *Mobile Security*, focused on Android security, and hands-on lab for extending Android's application framework with security extensions

Research Assistant

04/2013 – 04/2016

CENTER FOR IT-SECURITY, PRIVACY, AND ACCOUNTABILITY (CISPA), SAARLAND UNIVERSITY

Saarbrücken, Germany

- Research on extending Android's application framework with mandatory access control, augmenting Binder IPC with message provenance information, and creating domain isolation between apps

Research Assistant

10/2010 – 03/2013

CENTER FOR ADVANCED SECURITY RESEARCH DARMSTADT (CASED), TECHNICAL UNIVERSITY DARMSTADT

Darmstadt, Germany

- Research on extending Android's application framework and Linux kernel with mandatory access control, creating domain isolation between apps, and leveraging hardware security components in system security architectures

Research Intern

01/2010 – 06/2010

NOKIA RESEARCH CENTER, TRUSTWORTHY MOBILE PLATFORMS GROUP

Helsinki, Finland

- Master thesis on implementing an application-specific credential platform using a custom software-based mobile trusted platform module in a trusted execution environment (TI M-Shield / ARM TrustZone)

Research Intern

06/2009 – 08/2009

NOKIA RESEARCH CENTER, TRUSTWORTHY MOBILE PLATFORMS GROUP

Helsinki, Finland

- Topic: Binding execution of secure execution environments to user-space programs by integrating authenticated boot with TCG's Dynamic Root for Trusted Measurement

Research Intern

6/2008 – 08/2008

NOKIA RESEARCH CENTER, TRUSTWORTHY MOBILE PLATFORMS GROUP

Helsinki, Finland

- Topic: Implementation of software-based a trusted platform module for mobile secure execution environments using ARM TrustZone

Education

Ph.D. (with highest distinction)

10/2010 – 12/2015

SAARLAND UNIVERSITY

Saarbrücken, Germany

- Thesis: *Establishing Mandatory Access Control on Android OS*
- My work demonstrated how domain isolation policies can be enforced via mandatory access control extensions to the Android application framework and underlying Linux kernel. It further proposed an extension to Android's Binder IPC to support policy enforcement with message provenance information. The thesis comprises publications at the top-tier venues NDSS, USENIX Security, and ACSAC.

M.Sc. in Security and Mobile Computing (with distinction)

10/2008 – 09/2010

TECHNICAL UNIVERSITY OF DENMARK and ROYAL INSTITUTE OF TECHNOLOGY

Copenhagen, Denmark and Stockholm, Sweden

- Student in the European NordSecMob Erasmus Mundus Master's Programme in Security and Mobile Computing
- Thesis: *Using TCG/DRTM for application-specific credential storage and usage* (conducted at Nokia Research Center, Helsinki, Finland)
- This thesis demonstrated how measurements by authenticated boot can be combined with *late-launch* (DRTM) by the Trusted Computing Group to bind credentials to applications

Erasmus Programme of the European Union

09/2007 – 08/2008

HELSINKI UNIVERSITY OF TECHNOLOGY (now AALTO UNIVERSITY)

Helsinki, Finland

- Exchange student for two semesters

Pre-Diploma in Security in Information Science

10/2004 – 08/2008

HORST GÖRTZ INSTITUTE FOR IT SECURITY, RUHR-UNIVERSITY

Bochum, Germany




- Pre-Diploma is comparable to a B.Sc. degree

Awards

2019, Oct 14	Best teaching award for <i>Selected Topics in Mobile Security (Summer Term 2019)</i> at Computer Science Department of Saarland University
2015, Apr 20	Best teaching award for <i>Foundations of Cybersecurity (Winter Term 2014/2015)</i> at Computer Science Department of Saarland University
2015, Mar 25	Saarland award for outstanding university education 2014 ("Landespreis Hochschullehre 2014") for <i>Proseminar Hacking (Summer Term 2014)</i>
2014, Oct 20	Best teaching award for <i>Proseminar Hacking (Summer Term 2014)</i> at Computer Science Department of Saarland University
2012, Nov 29	4 th German IT Security Award, Finalist with the project CloudMiner: Automatic Tool for Security and Privacy Analysis of Cloud Infrastructures
2012, Nov 29	4 th German IT Security Award, Finalist with the BizTrust solution
2012, Oct 23	TeleTrust Innovation Award 2012 for the development of the BizTrust solution
2011, Oct 19	Best Paper at CMS'11 for <i>Twin Clouds: Secure Cloud Computing with Low Latency</i>

Scientific Publications

ONLINE PROFILES

	Google Scholar:	http://scholar.google.de/citations?user=sPrplusAAAAAJ
	DBLP:	https://dblp.org/pid/31/7561.html
	ORCID:	https://orcid.org/0000-0002-7151-9614

CONFERENCE PROCEEDINGS

- [1] S. Ghorbani Lyastani, M. Backes, and S. Bugiel, "A systematic study of the consistency of two-factor authentication user journeys on top-ranked websites," in *30th Annual Network & Distributed System Security Symposium (NDSS '23)*.
- [2] D. Chakraborty, M. Schwarz, and S. Bugiel, "Talus: Reinforcing TEE confidentiality with cryptographic coprocessors," in *27th International Conference on Financial Cryptography and Data Security (FC'23)*, 2023.
- [3] A. Dawoud and S. Bugiel, "Bringing balance to the force: Dynamic analysis of the Android application framework," in *28th Annual Network & Distributed System Security Symposium (NDSS '21)*, ISOC, 2021.
- [4] Y. Elbitar, M. Schilling, T. Nguyen, M. Backes, and S. Bugiel, "What really matters: The effect of timing & rationales on users' runtime permission decisions," in *31st USENIX Security Symposium (SEC '21)*, USENIX, 2021.

- [5] J. Huang, M. Backes, and S. Bugiel, “**A11y and privacy don’t have to be mutually exclusive: Constraining accessibility service misuse on Android**,” in *31st USENIX Security Symposium (SEC ’21)*, USENIX, 2021.
- [6] S. Ghorbani Lyastani, M. Schilling, M. Neumayr, M. Backes, and S. Bugiel, “**Is FIDO2 the kingslayer of user authentication? A comparative usability study of FIDO2 passwordless authentication**,” in *41st IEEE Symposium on Security and Privacy (SP ’20)*, IEEE, 2020.
- [7] D. C. Nguyen, E. Derr, M. Backes, and S. Bugiel, “**Fixdep: Android tool support to fix insecure code dependencies**,” in *36th Annual Computer Security Applications Conference (ACSAC ’20)*, ACM, 2020.
- [8] D. Chakraborty, C. Hammer, and S. Bugiel, “**Secure multi-execution in Android**,” in *34th Symposium on Applied Computing (SAC ’19)*, ACM, 2019.
- [9] D. Chakraborty, L. Hanzlik, and S. Bugiel, “**SimTPM: User-centric tpm for mobile devices**,” in *29th USENIX Security Symposium (SEC ’19)*, USENIX, 2019.
- [10] A. Dawoud and S. Bugiel, “**Droidcap: OS support for capability-based permissions in Android**,” in *26th Annual Network & Distributed System Security Symposium (NDSS ’19)*, ISOC, 2019.
- [11] J. Huang, N. Borges, S. Bugiel, and M. Backes, “**Up-to-crash: Evaluating third-party library updatability on Android**,” in *4th IEEE European Symposium on Security and Privacy (EuroSP ’19)*, IEEE, 2019.
- [12] D. C. Nguyen, E. Derr, M. Backes, and S. Bugiel, “**Short text, large effect: Measuring the impact of user reviews on Android app security & privacy**,” in *40th IEEE Symposium on Security and Privacy (SP ’19)*, IEEE, 2019.
- [13] S. G. Lyastani, M. Schilling, S. Fahl, M. Backes, and S. Bugiel, “**Better managed than memorized? studying the impact of managers on password strength and reuse**,” in *28th USENIX Security Symposium (SEC ’18)*, USENIX, 2018.
- [14] M. Oltrogge, E. Derr, C. Stransky, Y. Acar, S. Fahl, C. Rossow, G. Pellegrino, S. Bugiel, and M. Backes, “**The Rise of the Citizen Developer: Assessing the Security Impact of Online App Generators**,” in *39th IEEE Symposium on Security and Privacy (SP ’18)*, IEEE, 2018.
- [15] M. Backes, S. Bugiel, O. Schranz, P. von Styp-Rekowsky, and S. Weisgerber, “**ARTist: The Android runtime instrumentation and security toolkit**,” in *2nd IEEE European Symposium on Security and Privacy (EuroSP’17)*, IEEE, 2017.
- [16] M. Backes, S. Bugiel, P. von Styp-Rekowsky, and M. Wißfeld, “**Seamless in-app ad blocking on stock Android**,” in *Mobile Security Technologies (MOST) 2017 Workshop*, IEEE, 2017.
- [17] E. Derr, S. Bugiel, S. Fahl, Y. Acar, and M. Backes, “**Keep me Updated: An Empirical Study of Third-Party Library Updatability on Android**,” in *24th ACM Conference on Computer and Communication Security (CCS ’17)*, ACM, 2017.
- [18] J. Huang, O. Schranz, S. Bugiel, and M. Backes, “**The ART of App Compartmentalization: Compiler-based Library Privilege Separation on Stock Android**,” in *24th ACM Conference on Computer and Communication Security (CCS ’17)*, ACM, 2017.
- [19] Y. Acar, M. Backes, S. Bugiel, S. Fahl, P. McDaniel, and M. Smith, “**SoK: Lessons Learned From Android Security Research For Appified Software Platforms**,” in *37th IEEE Symposium on Security and Privacy (SP ’16)*, IEEE, 2016.
- [20] M. Backes, S. Bugiel, and E. Derr, “**Reliable Third-Party Library Detection in Android and its Security Applications**,” in *23rd ACM Conference on Computer and Communications Security (CCS ’16)*, ACM, 2016.
- [21] M. Backes, S. Bugiel, E. Derr, S. Gerling, and C. Hammer, “**R-Droid: Leveraging Android App Analysis with Static Slice Optimization**,” in *11th ACM Asia Conference on Computer and Communications Security (ASIACCS ’16)*, Invited paper, ACM, 2016.
- [22] M. Backes, S. Bugiel, E. Derr, P. McDaniel, D. Oceau, and S. Weisgerber, “**On Demystifying the Android Application Framework: Re-Visiting Android Permission Specification Analysis**,” in *26th USENIX Security Symposium (SEC ’16)*, USENIX, 2016.
- [23] M. Backes, S. Bugiel, C. Hammer, O. Schranz, and P. von Styp-Rekowsky, “**Boxify: Full-fledged app sandboxing for stock Android**,” in *24th USENIX Security Symposium (SEC ’15)*, USENIX, 2015.
- [24] M. Backes, S. Bugiel, and S. Gerling, “**Scippa: System-centric IPC provenance on Android**,” in *30th Annual Computer Security Applications Conference (ACSAC ’14)*, ACM, 2014.
- [25] M. Backes, S. Bugiel, S. Gerling, and P. von Styp-Rekowsky, “**Android Security Framework: Extensible multi-layered access control on Android**,” in *30th Annual Computer Security Applications Conference (ACSAC ’14)*, ACM, 2014.
- [26] S. Bleikertz, S. Bugiel, H. Ideler, S. Nürnberger, and A.-R. Sadeghi, “**Client-controlled Cryptography-as-a-Service in the Cloud**,” in *11th International Conference on Applied Cryptography and Network Security (ACNS’13)*, Springer, 2013.
- [27] S. Bugiel, S. Heuser, and A.-R. Sadeghi, “**Flexible and fine-grained mandatory access control on Android for diverse security and privacy policies**,” in *22nd USENIX Security Symposium (SEC ’13)*, USENIX, 2013.
- [28] F. F. Brasser, S. Bugiel, A. Filyanov, A.-R. Sadeghi, and S. Schulz, “**Softer smartcards: Usable cryptographic tokens with secure execution**,” in *Financial Cryptography and Data Security (FC’12)*, ser. LNCS, Springer, 2012.
- [29] S. Bugiel, L. Davi, A. Dmitrienko, T. Fischer, A.-R. Sadeghi, and B. Shastri, “**Towards taming privilege-escalation attacks on Android**,” in *19th Annual Network & Distributed System Security Symposium (NDSS’12)*, ISOC, 2012.
- [30] S. Bugiel, L. Davi, A. Dmitrienko, S. Heuser, A.-R. Sadeghi, and B. Shastri, “**Practical and lightweight domain isolation on Android**,” in *1st ACM CCS Workshop on Security and Privacy in Mobile Devices (SPSM’11)*, ACM, 2011.
- [31] S. Bugiel, L. Davi, and S. Schulz, “**Scalable trust establishment with software reputation**,” in *6th Annual Workshop on Scalable Trusted Computing (STC’11)*, ACM, 2011.

- [32] S. Bugiel, S. Nürnberger, A.-R. Sadeghi, and T. Schneider, “**Twin clouds: Secure cloud computing with low latency**,” in *Communications and Multimedia Security Conference (CMS’11)*, (Best Paper Award), Springer, 2011.
- [33] S. Bugiel, T. Pöppelmann, S. Nürnberger, A.-R. Sadeghi, and T. Schneider, “**AmazonIA: When elasticity snaps back**,” in *18th ACM Conference on Computer and Communications Security (CCS’11)*, ACM, 2011.
- [34] S. Bugiel, A.-R. Sadeghi, T. Schneider, and S. Nürnberger, “**Twin clouds: An architecture for secure cloud computing (extended abstract)**,” in *Workshop on Cryptography and Security in Clouds (CSC’11)*, 2011.
- [35] S. Bugiel, A. Dmitrienko, K. Kostianen, A.-R. Sadeghi, and M. Winandy, “**TruWalletM: Secure web authentication on mobile platforms**,” in *2nd Conference on Trusted Systems (INTRUST’10)*, 2010.
- [36] S. Bugiel and J.-E. Ekberg, “**Implementing an application-specific credential platform using late-launched mobile trusted module**,” in *5th Annual Workshop on Scalable Trusted Computing (STC’10)*, ACM, 2010.
- [37] J.-E. Ekberg and S. Bugiel, “**Trust in a small package: Minimized MRTM software implementation for mobile secure environments**,” in *4th Annual Workshop on Scalable Trusted Computing (STC’09)*, ACM, 2009.

TECHNICAL REPORTS

- [TR-1] M. Backes, S. Bugiel, S. Gerling, and P. von Styp-Rekowsky, “Android security framework: Enabling generic and extensible access control on Android,” Saarland University, Tech. Rep. A/01/2014, Apr. 2014.
- [TR-2] S. Bugiel, S. Heuser, and A.-R. Sadeghi, “myTunes: Semantically Linked and User-Centric Fine-Grained Privacy Control on Android,” Center for Advanced Security Research Darmstadt, Technical Report TUD-CS-2012-0226, 2012.
- [TR-3] —, “Towards a Framework for Android Security Modules: Extending SE Android Type Enforcement to Android Middleware,” Center for Advanced Security Research Darmstadt, Tech. Rep. TUD-CS-2012-0231, 2012.
- [TR-4] S. Bugiel, L. Davi, A. Dmitrienko, T. Fischer, and A.-R. Sadeghi, “XManDroid: A new Android evolution to mitigate privilege escalation attacks,” Technische Universität Darmstadt, Technical Report TR-2011-04, 2011.