

Anjo Vahldiek-Oberwagner

Present Address

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Contact Info

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INTERESTS	I'm interested in tackling hard problems by analyzing, designing, building and evaluating software systems. My current research focuses on building secure systems. In particular, techniques protecting data confidentiality and integrity of sensitive data at rest, in-flight or in-memory.	
EDUCATION	Ph.D. Candidate co-advised by Peter Druschel & Deepak Garg Max Planck Institute for Software Systems , Saarbruecken, Germany	2010 – 2019
	Ph.D. Candidate mentored by Holger Hermanns Saarland University , Graduate School, Saarbruecken, Germany	2009 – 2010
	Bachelor of Science in Applied Computer Science Baden-Württemberg Cooperative State University Stuttgart (DHBW Stuttgart) with IBM Germany Thesis: "Distributed Complex Query Processing for Informix Dynamic Server" GPA: 1.5 (scale 1.0 to 5.0), First Class, Top 10%	2006 – 2009
SKILLS	C, Java, Distributed Systems, Operating Systems, Secure System Design, Storage Systems, Trusted Computing, SSD/Flash Memory, Linux, Memory Safety and Isolation	
ACADEMIC HIGHLIGHTS	Ph.D. Candidate advised by Peter Druschel & Deepak Garg	2010 – 2019
	<i>ERIM: Secure, Efficient in-process isolation with Protection keys (MPK) [USENIX Security'19]</i> Isolating sensitive state and data can increase the security and robustness of many applications. Examples include protecting cryptographic keys against exploits like OpenSSL's Heartbleed bug or protecting a language runtime from native libraries written in unsafe languages. ERIM, a novel technique that provides hardware-enforced isolation with low overhead on x86 CPUs, even at high switching rates. <i>Guardat: Enforcing data policies at the storage layer [EuroSys'15]</i> In today's systems, policies protecting stored data and mechanisms for their enforcement are spread across many software components, increasing the risk of violation due to bugs, vulnerabilities and misconfigurations. Using Guardat, users, developers and administrators specify file protection policies declaratively, concisely and separate from code, and Guardat enforces these policies by mediating I/O in the storage layer.	
INDUSTRIAL EXPERIENCE	Research Scientist at Intel Labs	April'19 – now
	Intel Labs, Hillsboro, OR Research and improve security technologies. Build prototypes and provide guidance to their technology transfer. Current focus lies in building secure, accountable machine learning training and Function-as-a-Service prototypes, and memory protection techniques.	
	Research Software Engineering Intern	Summer 2014
	Microsoft Research, Redmond, WA Research opportunities to overcome performance and flexibility issues with Trusted Platform Modules (TPM) using Intel's new Software Guard Extension (SGX). Build and evaluate a prototype implementation. Mentor: Ronald Aigner (Principal Research Engineer)	
	Software Engineering Intern/Bachelor Thesis	2006 - 2009
	IBM, Boeblingen, Germany & Austin, Texas, USA Analyzed, designed and implemented prototypes. From optimizing distributed queries in Informix Dynamic Servers (IDS) to providing new programming models for heterogeneous processor architectures like the Cell/BE.	

PUBLICATIONS	<i>ERIM: Secure, Efficient In-process Isolation with Memory Protection Keys</i> Anjo Vahldiek-Oberwagner, Eslam Elnikety, Nuno O. Duarte, Michael Sammler, Peter Druschel, Deepak Garg Usenix Security 2019 Distinguished Paper Award and Internet Defense Prize 2019	
	<i>Techniques to Protect Confidentiality and Integrity of Persistent and In-Memory Data</i> Anjo Vahldiek-Oberwagner PhD Thesis 2019	
	<i>PESOS: Policy Enhanced Secure Object Store</i> Robert Krahn, Bohdan Trach, Anjo Vahldiek-Oberwagner, Thomas Knauth, Pramod Bhatotia, Christof Fetzer ACM EuroSys 2018	
	<i>Light-Weight Contexts: An OS Abstraction for Safety and Performance</i> James Litton, Anjo Vahldiek-Oberwagner, Eslam Elnikety, Deepak Garg, Bobby Bhattacharjee, Peter Druschel Usenix OSDI 2016	
	<i>Thoth: Comprehensive Policy Compliance in Data Retrieval Systems</i> Eslam Elnikety, Aastha Mehta, Anjo Vahldiek-Oberwagner, Deepak Garg, Peter Druschel Usenix Security 2016	
	<i>Guardat: Enforcing data policies at the storage layer</i> Anjo Vahldiek-Oberwagner, Eslam Elnikety, Aastha Mehta, Peter Druschel, Deepak Garg, Rodrigo Rodrigues, Johannes Gehrke, Ansley Post ACM EuroSys 2015	
	<i>Protecting Data Integrity with Storage Leases</i> Anjo Vahldiek, Eslam Elnikety, Ansley Post, Peter Druschel, Rodrigo Rodrigues Technical Report 2011-08, MPI-SWS, 2011 & granted patent	
	<i>A Verified Dependable Wireless Safety Critical Hard Real-Time Design</i> Hernan Baro Graf, Holger Hermanns, Juhi Kulshrestha, Jens Peter, Anjo Vahldiek, Aravind Vasudevan IEEE WoWMoM 2011	
	<i>Evaluation of an Optimization for Object Tracking – Feedback-Based Head-Tracking</i> Anjo Vahldiek, Ansgar Schneider, Stefan Schubert, Dirk Reichard Fifth Annual Meeting on Information Technology and Computer Science of the Baden-Wuerttemberg Cooperative State University, 2009	
WiP/POSTERS	<i>Thoth: Efficiently enforcing data confidentiality and integrity in large-scale distributed data processing systems</i> Eslam Elnikety, Anjo Vahldiek, Aastha Mehta, Deepak Garg, Peter Druschel ACM SOSP'13 Work in progress	
	<i>Trusted Storage</i> Anjo Vahldiek, Eslam Elnikety, Ansley Post, Peter Druschel, Deepak Garg, Johannes Gehrke, Rodrigo Rodrigues Usenix FAST'12 Work in progress	
Teaching	TA for Distributed Systems	Winter 2014
	TA for Operating Systems	Summer 2011
Honors & Awards	USENIX and Facebook Internet Defense Prize	2019
	Usenix Security Distinguished Paper Award	2019
	Max Planck Society, PhD Scholarship	2010 - 2016
	Saarland University, Graduate School PhD Scholarship	2009
	IBM International Internship Scholarship	2007

Recent Activities & Service	SOSP Artifact Evaluation Committee Member	2019
	External reviewer EuroSys	2018
	External reviewer HotOS	2017
	External reviewer OSDI	2016
	Co-Develop WelcomeHelp.de Refugee Volunteer Tool	2015
	Student Admission Volunteer MPI-SWS	2012
	General Student Meeting Coordinator MPI-SWS	2010