

Curriculum Vitae

Peter Amthor

Department of Computer Science and Automation
Technische Universität Ilmenau
P. O. Box 100565, 98684 Ilmenau, Germany

Phone: +49 3677 69 4163
eMail: peter.amthor@tu-ilmenau.de
Web: <https://www.tu-ilmenau.de/vsbs/team/peter-amthor>

ORCID: 0000-0001-7711-4450

Member of ACM SIGSAC, ACM SIGOPS, INSTICC, GI (German Informatics Society)

Research Interests

My research interests lie in formal foundations of secure IT systems, with the aim of making formal methods for their design, analysis, specification, and implementation more accessible to a broad range of applications. These include operating systems access control, information flow control for privacy protection, automated threat countermeasures, and usable security.

I have also worked in the areas of software engineering for secure applications, applied mobile security, image processing in metrology applications, and specification and analysis of distributed algorithms.

Education

03/2018: Ph. D. in Computer Science (Dr.-Ing.) from Technische Universität Ilmenau (TU Ilmenau).

Topic: "An Aspect-oriented Approach to Model-based Security Engineering" [11]

Final Grade: "magna cum laude"

Published as "Aspect-oriented Security Engineering" by Cuvillier Verlag [19]

12/2010: Diplom-Informatiker (Dipl.-Inf., equiv. M. Sc. in Computer Science) from Technische Universität Ilmenau (TU Ilmenau).

Topic: "Model-based Analysis of SELinux Security Policies"

Final Grade: 1.4 ("very good")

Professional Experience

04/2018–Present: Postdoctoral Researcher at TU Ilmenau, Germany. Research and teaching in the Operating Systems and Distributed Systems group.

10/2012–03/2018: Graduate Student at TU Ilmenau, Germany.

Supervisor: Prof. Dr.-Ing. habil. Winfried E. Kühnhauser, TU Ilmenau, Germany.

Additional reviews by Prof. Dr. Mahesh V. Tripunitara, University of Waterloo, Canada; Prof. Dr. Indrakshi Ray, Colorado State University, USA.

A main motivation for my dissertation was to enable a more streamlined and effective integration of model-based security analyses into the process of engineering software systems [2, 4, 3, 7]. The basic idea of my approach, to describe the engineering process through a pattern-like set of abstractions (*aspect*) tailored

towards some analysis goal, was tested against the practical use case of mandatory access control policies in operating systems. My evaluation included a heuristic analysis method of SELinux security policies for potential privilege escalation vulnerabilities (*safety property*) [5, 6, 8, 10].

01/2011–06/2017: Research Assistant at TU Ilmenau, Germany.

06/2009–09/2009: Intern at Hitachi Systems Development Laboratory (Hitachi SDL), Yokohama, Japan. Design and implementation of two functions of a mobile data management system: encrypted data storage and secure Bluetooth communication.

04/2008–05/2009: Student Assistant at TU Ilmenau, Germany in Special Research Field (SFB) 622: Research on Nanopositioning and Nanomeasuring Technology.

Grants

08/2019–07/2020: Internal Research Funding from TU Ilmenau (15.000 €).

07/2017–09/2017: Graduation Scholarship from TU Ilmenau (3.900 €).

Academic Community Service

Active reviewer for IEEE Access, Elsevier Computers & Security.

PC member at ICSOFT 2019–2020, CyberTIM Workshop at ARES 2020–2021, SECRIPT 2021–22.

Shadow PC member at EuroSys 2013.

Teaching

Summer 2020: Special Award for Excellent Teaching at the Dept. of Computer Science and Automation

Winter 2017: Winner of Best Elective Lecture Award at the Dept. of Computer Science and Automation for *Advanced Operating Systems*

10/2017–Present: Lecturer at TU Ilmenau for

- *Operating Systems* (B.Sc. Computer Science)
- *Advanced Operating Systems* (B.Sc. Computer Science)
- *Systems Security* (B.Sc. Computer Science, M.Sc. Research in Computer and Systems Engineering)
- *Security Engineering* (M.Sc. Computer Science)

01/2011–06/2017: Seminar and Workshop Instructor at TU Ilmenau for

- *Systems Security* (B.Sc. Computer Science, M.Sc. Research in Computer and Systems Engineering)
- *Security Engineering* (M.Sc. Computer Science)
- *Operating Systems* (B.Sc. Computer Science)
- *Distributed Algorithms* (M.Sc. Computer Science)
- *Transactional Information Systems* (M.Sc. Computer Science)
- *Research Skills* (M.Sc. Research in Computer and Systems Engineering)

Personal Information

Nationality: German

Languages: German (native), English (fluent), French (good), Japanese (basic), Russian (basic)

Publications

- [1] Peter Amthor, Anja Fischer, and Winfried E. Kühnhauser. Analyse von Zugriffssteuerungssystemen. In Patrick Horster and Peter Schartner, editors, *D·A·CH Security 2009*, pages 49–61. syssec Verlag, 2009.
- [2] Peter Amthor, Winfried E. Kühnhauser, and Anja Pölck. Model-based Safety Analysis of SELinux Security Policies. In P. Samarati, S. Foresti, J. Hu, and G. Livraga, editors, *In Proc. of 5th Int. Conference on Network and System Security*, pages 208–215. IEEE, 2011.
- [3] Peter Amthor and Winfried E. Kühnhauser. Leichtgewichtige Sicherheitsdomänen für spontane Kooperationen. In Patrick Horster and Peter Schartner, editors, *D·A·CH Security 2013*, pages 260–274. syssec Verlag, 2013.
- [4] Peter Amthor, Winfried E. Kühnhauser, and Anja Pölck. Heuristic Safety Analysis of Access Control Models. In *Proceedings of the 18th ACM Symposium on Access Control Models and Technologies, SACMAT '13*, pages 137–148, New York, NY, USA, 2013. ACM.
- [5] Peter Amthor, Winfried E. Kühnhauser, and Anja Pölck. WorSE: A Workbench for Model-based Security Engineering. *Computers & Security*, 42(0):40–55, 2014.
- [6] Peter Amthor. A Uniform Modeling Pattern for Operating Systems Access Control Policies with an Application to SELinux. In *Proceedings of the 12th International Conference on Security and Cryptography, SECURITY 2015*, pages 88–99, 2015.
- [7] Peter Amthor and Winfried E. Kühnhauser. Security Policy Synthesis in Mobile Systems. In *Proceedings of the IEEE SERVICES 2015 Visionary Track: Security and Privacy Engineering Theme, SPE '15*, pages 189–197, Washington, DC, USA, 2015. IEEE Computer Society.
- [8] Peter Amthor. The Entity Labeling Pattern for Modeling Operating Systems Access Control. In S. Mohammad Obaidat and Pascal Lorenz, editors, *E-Business and Telecommunications: 12th International Joint Conference, ICETE 2015, Colmar, France, July 20–22, 2015, Revised Selected Papers*, pages 270–292. Springer International Publishing, Cham, 2016.
- [9] Peter Amthor and Winfried E. Kühnhauser. Privacy in sozialen Netzwerken: Eine Informationsflussanalyse. In Patrick Horster and Peter Schartner, editors, *D·A·CH Security 2016*, pages 224–240. syssec Verlag, 2016.
- [10] Peter Amthor. Efficient Heuristic Safety Analysis of Core-based Security Policies. In *Proceedings of the 14th International Conference on Security and Cryptography, SECURITY 2017*, pages 384–392, 2017.
- [11] Peter Amthor. *An Aspect-oriented Approach to Model-based Security Engineering*. PhD thesis, Technische Universität Ilmenau, Ilmenau, Germany, March 2018.
- [12] Peter Amthor. Modellierung und formale Analyse von Betriebssystem-Sicherheitspolitiken. Talk at the fall meeting of the German Informatics Society (Gesellschaft für Informatik), October 2018. Abstract (in German) available at <https://www.tu-ilmenau.de/fileadmin/media/vsbs/Publikationen/amthor-fgbs18-abstract.pdf>.
- [13] Peter Amthor, Daniel Fischer, Winfried E. Kühnhauser, and Dirk Stelzer. Automated Cyber Threat Sensing and Responding: Integrating Threat Intelligence into Security-Policy-Controlled Systems. In *Proceedings of the 14th International Conference on Availability, Reliability and Security, ARES '19*, pages 86:1–86:10, New York, NY, USA, 2019. ACM.
- [14] Felix Wiemuth, Peter Amthor, and Winfried E. Kühnhauser. Static Termination Analysis for Event-driven Distributed Algorithms. In *Proceedings of the 13th ACM International Conference on Distributed and Event-based Systems, DEBS '19*, pages 151–162, New York, NY, USA, 2019. ACM.
- [15] Peter Amthor and Martin Rabe. Command Dependencies in Heuristic Safety Analysis of Access Control Models. In Abdelmalek Benzekri, Michel Barbeau, Guang Gong, Romain Laborde, and Joaquin Garcia-Alfaro, editors, *Foundations and Practice of Security (FPS 2019)*, volume 12056 of LNCS, pages 207–224,

Cham, 2020. Springer International Publishing.

- [16] Peter Amthor and Marius Schlegel. Towards Language Support for Model-based Security Policy Engineering. In Pierangela Samarati, Sabrina De Capitani di Vimercati, Mohammad S. Obaidat, and Jalel Ben-Othman, editors, *Proceedings of the 17th International Conference on Security and Cryptography*, SECRYPT 2020, pages 513–521. INSTICC, SciTePress, 2020.
- [17] Marius Schlegel and Peter Amthor. Beyond Administration: A Modeling Scheme Supporting the Dynamic Analysis of Role-based Access Control Policies. In Pierangela Samarati, Sabrina De Capitani di Vimercati, Mohammad S. Obaidat, and Jalel Ben-Othman, editors, *Proceedings of the 17th International Conference on Security and Cryptography*, SECRYPT 2020, pages 431–442. INSTICC, SciTePress, 2020.
- [18] Marius Schlegel and Peter Amthor. The Missing Piece of the ABAC Puzzle: A Modeling Scheme for Dynamic Analysis. In Sabrina De Capitani di Vimercati and Pierangela Samarati, editors, *Proceedings of the 18th International Conference on Security and Cryptography*, SECRYPT 2021, pages 234–246. INSTICC, SciTePress, 2021.
- [19] Peter Amthor. *Aspect-oriented Security Engineering*. Cu villier Verlag, Göttingen, Germany, 2019. ISBN 978-3-7369-9980-0.