Curriculum Vitae

Prof. (FH) Priv.-Doz. Dr. Dominik Engel

Personal Details

Name	Dominik Engel
Academic Degree	Priv.-Doz. Dipl.-Ing. Mag. Dr.
Contact Details	Salzburg University of Applied Sciences Urstein Sued 1, 5412 Puch/Salzburg, Austria E-Mail: dominik.engel@fh-salzburg.ac.at
Web	https://www.fh-salzburg.ac.at/
ORCID	0000-0002-0946-2426

Education

Aug. 2018	Habilitation (venia docendi) for Applied Informatics at the University of Salzburg Reviewers: Prof. Negar Kiyavash (Georgia Institute of Technology, USA), Prof. Hartmut Schmeck (Karlsruhe Institute of Technology, Germany), Prof. Astrid Nieße (University of Hannover, Germany)
Sep. 2008	Doctoral Degree in Technical Sciences (passed with distinction), University of Salzburg PhD Thesis on "Media Encryption for Still Visual Data" Supervisor: Univ.-Prof. Dr. Andreas Uhl
Apr. 2004	Master's Degree in English and American Literature and Language Studies (passed with distinction), University of Salzburg
Dec. 2002	Master's Degree in Applied Informatics with application domain "Artificial Intelligence" (passed with distinction), University of Salzburg
1998/99	Year abroad at University of East Anglia (UK)
June 1996	A-Levels/Matura (passed with distinction), Bundesrealgymnasium Innsbruck, Sillgasse

Academic and Professional Career

sind Oct. 2023	Rector at Salzburg University of Applied Sciences
since Sep. 2022	Managing Director at Salzburg University of Applied Sciences
since June 2020	Member of the Board of "Kreditschutzverband von 1870"
since Nov. 2019	Chief Research Officer at spin-off "sproof "
since Dec. 2018	Member of the Senate of the Christian Doppler Research Association
since Aug. 2018	Visiting professor ("Privatdozent") at University of Salzburg
since Sep. 2016	Member of the Board of Salzburg Wohnbau Group
since Dec. 2011	FH-Professor at the Salzburg University of Applied Sciences

Jan. 2018 – Aug. 2022	Director Center for Secure Energy Informatics
Sep. 2015 – Aug. 2022	Head of Department *Network Technologies and Security* at the Salzburg University of Applied Sciences
Jan. 2013 – Dec. 2017	Director Josef Ressel Center for User-Centric Smart Grid Privacy, Security and Control
Sep. 2010–Nov. 2011	Senior Researcher and Lecturer at the Salzburg University of Applied Sciences
Oct. 2008–Aug. 2010	International Product Manager Content Security at Sony DADC
March 2006–Sep. 2008	Researcher at the Department of Computer Sciences at the University of Salzburg
May 2005–Feb. 2006	Austrian Academy of Sciences scholar (DOC Dissertation Grant)
Nov. 2004–April 2005	Research Associate in the research group "Multimedia Signal Processing and Security" at the University of Salzburg
March 2003–Sep. 2004	Research Associate in the DFG Collaborative Research Centre SFB/TR 8 "Spatial Cognition" at the University of Bremen
Nov. 2000–Dez. 2002	Research Assistant in the research group "Multimedia Signal Processing and Security" at the University of Salzburg
2000–2004	Development and support of a forecasting software for "Wind River"
2000–2001	Development and suppport of a CRM software for student bank accounts for "Bank Austria"
1999–2002	Board member and project manager for "subnet"
1998	Founding member of non-profit organization "subnet – platform for media culture and experimental technologies"

Research Projects

Jan. 2018–Aug. 2022	Center for Secure Energy Informatics Director, 20 researchers
March 2021–Aug. 2022	ECOSINT – "Energy Communities System Integration" (FFG project no. 881165) Consortium Lead, project volume €1.4m
Nov. 2019–Aug. 2022	DET – "Digital Energy Twin" (FFG project no. 873599) Lead for work package on secure communication and data handling
Jan. 2013–Dec. 2017	Josef Ressel Center for User-Centric Smart Grid Privacy, Security and Control Director, 14 researchers
March 2019–Feb. 2020	"Future Network Tariffs" (FFG project no. 871711) Lead for Privacy and Security, 3 researchers
Jun. 2015–Nov. 2017	RASSA-Architektur – "Reference Architecture for a Secure Smart Grid in Austria" (FFG project no. 848811), Lead Work Package "Secure Consumer Integration", 3 researchers
Sept. 2015–Aug. 2016	PROMISE – "Process Mining for Intrusion Detection in Smart Energy Grids" (FFG project no. 849914) Consortium Lead, 3 researchers
Apr. 2013–Sep. 2015	INTEGRA – "Integrated Smart Grid Reference Architecture of Local Intelligent Distribution Grids and Transregional Virtual Power Plants" (FFG Project No. 838793) Project Lead for University of Applied Sciences, one researcher

Jan. 2012–Dec. 201 4	"Privacy-protected Video Surveillance on Scalable Bitstreams" (FFG Project No. 832082) Project Lead for University of Applied Sciences
Aug. 2011–Jan. 2012	"Security in Industrial Process Control Systems", (Collaborative project with company partner Copa-data) Principal Project Lead, two research assistants
Nov. 2006–Sep. 2008	"Adaptive Streaming of Secure & Scalable Wavelet Videos" (FWF project no. P19159) Researcher
Nov. 2004–Feb. 2008	EU Network of Excellence ECRYPT (IST-2002-507932) Researcher
Nov. 2004–Dec. 2005	"Adaptive Security Techniques for Visual Data in Wavelet-based Representation" (FWF project no. P15170) Researcher
Mar. 2003–Sep. 2004	"R1-[ImageSpace]" in the DFG Collaborative Research Centre SFB TR/8 "Spatial Cognition" Researcher
Nov. 2000–Dec. 2002	"Object-based Image and Video Compression with Adaptive and Hybrid Wavelet Techniques" (FWF Project No. P13732) Researcher

Professional Trainings

2018	Director's Programme, Salzburg Management and Business School
2012	Leadership (Salzburg University of Applied Sciences)
2011	Cisco Certified Academy Instructor (CCAI)
2010	The Storyboard Approach – Advanced techniques of creating powerful presentations (BCD Business Communication Design, Switzerland)
2009	Leadership Competence (Sony DADC)
2009	Functional Competence (Sony DADC)

Contributions to Standardization

since 2013	CEN/CENELEC/ETSI Smart Grid Co-ordination Group (European Mandate M/490), Working Group "'Smart Grid Information Security (SGIS)'", Work Package 3: Privacy
since 2013	German Commission for Electrical, Electronic & Information Technologies of DIN and VDE (DKE), Steering Committee STD_1911 "Normung E-Energy / Smart Grids", Working Group STD_1911.11 "Smart Grid Informationssicherheit'"
since 2013	German Association for Electrical, Electronic & Information Technologies (VDE), Working Group "Energy Information Networks" (in German: "Energieinformationsnetze")
since 2013	Austrian Computer Society (OCG), Working Group "Energy Informatics" (in German: "Energieinformatik")
since 2014	Austrian Technology Platform for Smart Grids
since 2014	Austrian Electrotechnical Association (ÖVE), Working Group "Smart Grids"

Grants and Awards

2021	Member of fit4internet Taskforce
2020	Nomination for Houska-Prize
2009	Nominated by the University of Salzburg for the "Gesellschaft für Informatik (GI)" dissertation award
2006	EU Network of Excellence in Cryptology ECRYPT research grant
2005	Austrian Academy of Sciences (ÖAW) DOC dissertation grant (acceptance rate 2005: 17%)
2003	University of Salzburg merit grant for passing the Master's degree in Applied Informatics with distinction
2001–2002	Austrian Science Fund (FWF) research grant

Talks (Selection)

- *Security and Privacy in Digital Innovation* (in German, Atrium Unternehmensgespräche (hosted by the Salzburg Chamber of Notaries), 2019
- *Blockchain: Silver Bullet oder Rohrkrepierer?* (in German), Industry Day of the Salzburg Chamber of Commerce, 2018
- *IT-Security for Future Energy Systems: A Lost Cause?*, Keynote, DACH+ Energy Informatics, Oldenburg 2018, Germany, 2018
- *Datensicherheit und Datenschutz: Was bringt die Datenschutz-Grundverordnung (DSGVO)?*, Federation of Austrian Industry, 2018
- *The Interplay of Data Resolution and Privacy in Smart Metering*, Invited Talk, Department of Electrical Engineering, Cornell University, Ithaca, USA, 2017
- *The Interplay of Data Resolution and Privacy in Smart Metering*, Dagstuhl Seminar 16032 "Privacy and Security in Smart Energy Grids", `http://dx.doi.org/10.4230/DagRep.6.1.99`, Dagstuhl, Germany, 2016
- *Privacy-preserving Smart Metering: Methods and Applicability*, Keynote – Communications for Energy Workshop, Vienna, Austria, 2013
- *Privacy and Security Challenges in the Privacy and Security Challenges in the Smart Grid User Domain*, Keynote – 1st ACM Workshop on Information Hiding and Multimedia Security, Montpellier, France, 2013
- *Privacy Challenges in Smart Grids*, Panel Session on Smart Grid Security, IEEE ISGT EU 2014, Istanbul, Turkey
- Panelist Round Table *Sichere IKT Architektur im Smart Grid* (in German), Session "Sicherheit, Systemkontrolle und Versorgungssicherheit", Smart Grids Week, Salzburg, Austria, 2013
- *Datenschutz im Smart Metering: Herausforderungen und Lösungsansätze* (in German), VDE Smart Grid Forum,
  Hannover Messe (Industry trade show on industrial automation, energy, industrial supply and more), Germany, 2014
- Panelist Round Table *Smart Metering – hemmen Privacy Bedenken den technischen Fortschritt?* (in German), Session "Kunden und Märkte", Smart Grids Week, Graz, Austria, 2014
- *Status der europäischen Standardisierung für IT-Security und Privacy im Smart Grid* (in German), Österreichs Energie, Vienna, Austria, 2014
- *Sichere IKT-Architektur im Smart Grid* (in German), Österreichs Energie, Vienna, Austria, 2013

- *Datenschutz und -sicherheit im intelligenten Stromnetz* (in German), Lecture series "Anwendungen in Wirtschaft und Technik", University of Salzburg, Austria, 2013
- *Video Processing Activities and Applied Research at Sony DADC*, with M. Aster, Invited Talk – 6th International Symposium on Image and Signal Processing and Analysis (ISPA '09), Salzburg, Austria, 2009

TPC and Reviewing Activities

- Member of the Steering Committee of DACH+ Energy Informatics (since 2019)
- Associate Editor for Springer EURASIP Journal on Information Security (2016 – 2022)
- Member of the Steering Committee of ARES – Conference on Availability, Reliability and Security (2020–2022)
- Program Committee Co-Chair for Conference on Availability, Reliability and Security (ARES) 2022 (together with Matthias Fischer, Univ. Hamburg)
- General Chair for DACH+ Conference on Energy Informatics 2019
- General Chair and Program Committee Chair for Conference on Availability, Reliability and Security (ARES) 2016 (together with Stephen Wicker, Cornell University)
- Chair for Special Session on "Security and Privacy Technologies for Intelligent Energy Networks" at ACM IHMMSEC 2014 (together with Zekeriya Erkin, TU Delft)
- Reviewer for URSES+ Research Program for the Netherlands Organisation for Scientific Research (NWO)
- Reviewer for "Deutsche Forschungsgemeinschaft" (DFG, German Research Society)
- Reviewing for Journals
  IEEE Transactions on Smart Grid, IEEE Letters of the Computer Society, IEEE Transactions on Power Systems, Communications of the ACM, Elsevier Blockchain: Research and Applications, Elsevier Computers & Security, IEEE Transactions on Network and Service Management, IEEE Systems Journal, Wiley Journal of Software: Evolution and Process, IEEE Transactions on Emerging Topics in Computational Intelligence, IEEE Transactions on Dependable and Secure Computing, Springer EURASIP Journal on Information Security (Associate Editor), Elsevier Signal Processing: Image Communication, Elsevier Journal of Information Security and Applications, IEEE Transactions on Industrial Electronics, IEEE Transactions on Industrial Informatics, MDPI Energies, IEEE Transactions on Image Processing, Hindawi International Journal of Distributed Sensor Networks, IEEE Transactions on Circuits and Systems for Video Technology, Journal of Computing and Information Technology, IEEE Transactions on Information Forensics and Security, IET Journal on Image Processing, EURASIP Journal on Image and Video Processing, IET Journal on Information Security, International Journal of Image and Graphics

- Conference Technical Program Committees
  ACM eEnergy 2022, "DACH+ Energy Informatics 2022", "GI Sicherheit 2022", ACM eEnergy 2021, Session Chair "NILM", "DACH+ Energy Informatics" 2021, ACM eEnergy 2020, "DACH Energy Informatics" 2020, ACM eEnergy 2019, "DACH Energy Informatics" 2019, ACM eEnergy 2018, "DACH Energy Informatics" 2018, "GI Sicherheit" 2018, "DACH Energieinformatik" 2017, IEEE Innovative Smart Grid Technologies (ISGT) 2017, Conference on Availability, Reliability and Security (ARES) 2017, IEEE International Conference on Industrial Informatics (INDIN) 2016, Conference on Availability, Reliability and Security (ARES) 2016, "DACH Energieinformatik" 2016, IEEE Symposium on Industrial Electronics (ISIE) 2016, IEEE Emerging Technologies and Factory Automation (ETFA) 2016, Conference on Availability, Reliability and Security (ARES) 2015, International Workshop on Multimedia Forensics and Security (MFSec) 2015, Smart Energy Grid Security Workshop (SEGS) 2014, IEEE IECON 2014, ACM IHMMSEC 2014, "GI Sicherheit" 2014, "DACH Security" 2014, "DACH Security" 2013, IEEE IECON 2013, IEEE IWIES 2013, Workshop in Information Security Theory and Practice (WISTP)

2004, European Conference on Artificial Intelligence (ECAI) 2004, Member of the organizing committee und Session Chair "Media Encryption" of "International Conference on Communications and Multimedia Security" (CMS) 2005, Member of the organizing committee of ECRYPT Summer School on Multimedia Security 2005, Member of the review and organisation committee of International Conference on Spatial Cognition 2003, Member of the organizing committee of International Workshop on Spatial and Visual Components in Mental Reasoning About Large-Scale Spaces 2003

Teaching

- "Network Reliability and Virtualization", Salzburg University of Applied Sciences (since 2013)
- "Internet Infrastructure and Security", Salzburg University of Applied Sciences (since 2013)
- "Cryptology", Salzburg University of Applied Sciences (since 2006)
- "Network Reliability and Security", Salzburg University of Applied Sciences (2011–2012)
- "Mobile & Distribution Networks", Salzburg University of Applied Sciences (2010-2012)
- "Energy Informatics", University of Salzburg (since 2019)
- "Security and Privacy in Resilient Systems", University of Freiburg, Germany (2019)
- "Privacy Enhancing Technologies", University of Salzburg (2019)
- "Mobile Networks and Security" (Lecture Part on IT-Security), Salzburg University of Applied Sciences (since 2015)
- "Energy Informatics Fundamentals: Network and Communication Technologies", Salzburg University of Applied Sciences (since 2015)
- "Master Seminar", Salzburg University of Applied Sciences (2011)
- "Multimedia Technologies", Salzburg University of Applied Sciences (2010–2013)
- "Distributed and Autonomous Systems", Salzburg University of Applied Sciences (2009)
- "Advanced Topics in Databases", University of Salzburg (2008)
- "Database Systems", University of Salzburg (2007–2008)
- "Introduction to Unix Systems", University of Salzburg (2006–2008)
- "Software Project", University of Bremen, Germany (2003–2004)
- "Software Development", University of Bremen, Germany (2003)

Supervision of PhD Theses

- Dejan Radovanovic (University of Salzburg, supervision handed over to Andreas Unterweger in 2022), *Privacy-Preserving Data Handling and Analytics for Local Energy Communities*
- Fabian Knirsch (University of Salzburg, PhD, 2018), *Privacy Enhancing Technologies in the Smart Grid User Domain*, joint supervision with Andreas Uhl, Univ. of Salzburg
- Christian Neureiter (University of Oldenburg, PhD, 2017), *A Domain-Specific, Model-Driven Engineering Approach for Systems Engineering in the Smart Grid*, joint supervision with Sebastian Lehnhoff, Univ. of Oldenburg
- Clemens Brunner (University of Salzburg, PhD, 2021), *Decentralized Trust Management for Privacy-Preserving Authentication in the Smart Grid*
- Bastian Fraune (University of Oldenburg), *Automated Monitoring of Operational IT-Security and Compliance*, Mentor ("Shepherd") for the Energy Informatics PhD Workshop 2021, Dissertation Supervisor: Sebastian Lehnhoff

- Hafsa Bousbiat (University of Klagenfurt), *Applications of Non-intrusive Load Monitoring (NILM) in Smart Homes*, Mentor ("Shepherd") for the Energy Informatics PhD Workshops 2020, Dissertation Supervisor: Wilfried Elmenreich
- Anna Volkova (University of Passau), *Blackout Recovery: Resilient NFV-enabled ICT Infrastructure for the Smart Grid*, Mentor ("Shepherd") for the Energy Informatics PhD Workshops 2019, Dissertation Supervisor: Hermann de Meer
- Jonas Schlund (University of Erlangen), *Distributed Orchestration of Power Systems Based on Blockchains*, Mentor ("Shepherd") for the Energy Informatics PhD Workshops 2018, Dissertation Supervisor: Reinhard German
- Michael Brand (University of Oldenburg), *ASSESS – Anomaly-Sensitive State Estimation with Streaming Systems in Smart Grids*, Mentor ("Shepherd") for the Energy Informatics PhD Workshop 2017, Dissertation Supervisor: Sebastian Lehnhoff
- Kaibin Bao (Karlsruhe Institute of Technology), *Measuring Information Disclosure in Load Monitoring Data by Disaggregation of Sum Load Profiles*, Mentor ("Shepherd") for the Energy Informatics PhD Workshops 2014, Dissertation Supervisor: Hartmut Schmeck

Supervision of Master's Theses (Selection)

- Michael Egger (Salzburg University of Applied Sciences, MSc., 2019), *Anomaly detection in control systems of transmission system operators*
- Stefan Binna (Salzburg University of Applied Sciences, MSc., 2018), *Intrusion Detection in Cyber-Physical Systems*, joint supervision with Victor Prasanna, University of Southern California, USA
- Christian Promper (Salzburg University of Applied Sciences, MSc., 2017), *Anomaly Detection in Smart Grids with Imbalanced Data Methods*, joint supervision with Robert C. Green, Bowling Green State University, USA
- Joris Lückenga (Salzburg University of Applied Sciences, MSc., 2015), *Reduction of False Positives in Smart Grid Intrusion Detection*, joint supervision with Robert C. Green, Bowling Green State University, USA
- Christian Peer (Salzburg University of Applied Sciences, MSc., 2014), *Secure Signal Processing for Smart Grid Privacy*, joint supervision with Stephen Wicker, Cornell University, USA
- Fabian Knirsch (Salzburg University of Applied Sciences, MSc., 2014), *Generic Data Models and Semantic Retrieval in Smart Grid IT Infrastructures*, joint supervision with Victor Prasanna, University of Southern California, USA
- Wolfgang Lausenhammer (Salzburg University of Applied Sciences, MSc., 2014), *User-Centric Simulation of Demand Response Optimization*, joint supervision with Robert C. Green, Bowling Green State University, USA
- René Blaschke (Salzburg University of Applied Sciences, MSc., 2012), *Entwurf und Implementierung einer sicheren IKT-Architektur für Smart Grids*
- Christian Peuker (Salzburg University of Applied Sciences, MSc., 2012), *Kommunikationssicherheit in einer Smart Metering Infrastructure*
- Markus Schober (Salzburg University of Applied Sciences, MSc., 2012), *Evaluation of privacy protection methods with JPEG2000 ROI encryption in video surveillance scenarios*
- Michael Lechner (University of Salzburg, MSc., 2009), *Object persistence and object relational mapping*, joint supervision with Helge Hagenauer, Univ. of Salzburg

Journal Publications

[1] D. Radovanovic, A. Unterweger, G. Eibl, D. Engel, and J. Reichl. How unique is weekly smart meter data? *Energy Informatics*, 5(1):1–13, 2022.

[2] A. Unterweger, F. Knirsch, D. Engel, D. Musikhina, A. Alyousef, and H. de Meer. An analysis of privacy preservation in electric vehicle charging. *Energy Informatics*, 5:1–27, 4 2022.

[3] M. Egger, G. Eibl, and D. Engel. Comparison of Approaches for Intrusion Detection in Substations using the IEC 60870-5-104 Protocol. *Energy Informatics*, 3:1–17, 2020.

[4] F. Knirsch, C. Brunner, A. Unterweger, and D. Engel. Decentralized and Permission-less Green Energy Certificates with GECKO. *Energy Informatics*, 3(2):1–17, 2020.

[5] V. Azarova, D. Engel, C. Ferner, A. Kollmann, and J. Reichl. Transition to peak-load-based tariffs can be disruptive for different groups of consumers. *Nature Energy*, 4:829–830, 2019.

[6] F. Knirsch, A. Unterweger, and D. Engel. Implementing a Blockchain from Scratch: Why, How, and What We Learned. *EURASIP Journal on Information Security*, 2019(2):1–14, 3 2019.

[7] F. Knirsch, O. Langthaler, and D. Engel. Trust-less electricity consumption optimization in local energy communities. *Energy Informatics 2019*, 2(1):1–12, 2019.

[8] V. Azarova, D. Engel, C. Ferner, A. Kollmann, and J. Reichl. Exploring the impact of network tariffs on household electricity expenditures using load profiles and socio-economic characteristics. *Nature Energy*, 3:317–325, 2018.

[9] D. Engel and G. Eibl. Wavelet-based multiresolution smart meter privacy. *IEEE Transactions on Smart Grid*, 8(4):1710–1721, July 2017.

[10] F. Knirsch, G. Eibl, and D. Engel. Multi-resolution privacy-enhancing technologies for smart metering. *EURASIP Journal on Information Security*, 2017(1):6, 2017.

[11] C. Neureiter, D. Engel, and M. Uslar. Domain specific and model based systems engineering in the smart grid as prerequesite for security by design. *Electronics*, 5(2):24, 2016.

[12] A. Unterweger, F. Knirsch, G. Eibl, and D. Engel. Privacy-preserving load profile matching for tariff decisions in smart grids. *EURASIP Journal on Information Security*, 2016(1):1–17, 2016.

[13] W. Lausenhammer, D. Engel, and R. Green. Utilizing capabilities of plug in electric vehicles with a new demand response optimization software framework: Okeanos. *International Journal of Electrical Power and Energy Systems*, 75:1–7, 2016.

[14] G. Eibl and D. Engel. Influence of data granularity on smart meter privacy. *IEEE Transactions on Smart Grid*, 6(2):930–939, March 2015.

[15] A. Unterweger and D. Engel. Resumable load data compression in smart grids. *IEEE Transactions on Smart Grid*, 6(2):919–929, March 2015.

[16] C. Neureiter, G. Eibl, D. Engel, S. Schlegel, and M. Uslar. A concept for engineering smart grid security requirements based on SGAM models. *Computer Science - Research and Development*, pages 1–7, 2014.

[17] S. Auer, A. Bliem, D. Engel, A. Uhl, and A. Unterweger. Bitstream-based JPEG encryption in real-time. *International Journal of Digital Crime and Forensics*, 5(3):1–14, 2013.

[18] D. Engel, T. Stütz, and A. Uhl. Assessing JPEG2000 encryption with key-dependent wavelet packets. *EURASIP Journal on Information Security*, 2012(1):1–16, 2012.

[19] D. Engel, T. Stütz, and A. Uhl. A survey on JPEG2000 encryption. *Multimedia Systems*, 15(4):243–270, 2009. Springer.

[20] R. Kutil and D. Engel. Methods for the anisotropic wavelet packet transform. *Applied and Computational Harmonic Analysis*, 25(3):295–314, 2008.

[21] D. Engel, E. Pschernig, and A. Uhl. An analysis of lightweight encryption schemes for fingerprint images. *IEEE Transactions on Information Forensics and Security*, 3(2):173–182, June 2008.

[22] D. Engel, T. Stütz, and A. Uhl. Format-compliant JPEG2000 encryption in JPSEC: Security, applicability and the impact of compression parameters. *EURASIP Journal on Information Security*, (Article ID 94565):doi:10.1155/2007/94565, 20 pages, 2007.

Book Chapters and Contributions to Collections

[23] F. Knirsch, A. Unterweger, and D. Engel. Privacy-preserving blockchain-based electric vehicle charging with dynamic tariff decisions. *Computer Science - Research and Development*, 9 2017.

[24] F. Knirsch, A. Unterweger, G. Eibl, and D. Engel. Privacy-preserving smart grid tariff decisions with block-chain-based smart contracts. In W. Rivera, editor, *Sustainable Cloud and Energy Services: Principles and Practices*. Springer International Publishing, 2017.

[25] G. Eibl and D. Engel. Differential privacy for real smart metering data. *Computer Science – Research and Development*, 32(1):173–182, 2017.

[26] F. Knirsch, D. Engel, C. Neureiter, M. Frincu, and V. Prasanna. Privacy assessment of data flow graphs for an advanced recommender system in the smart grid. In O. Camp, E. Weippl, C. Bidan, and E. Aïmeur, editors, *Information Systems Security and Privacy – Revised and Selected Papers of ICISSP 2015*, volume 576 of *Communications in Computer and Information Science*, pages 89–106. Springer International Publishing, 2016. Best Paper Award.

[27] C. Dänekas, C. Neureiter, S. Rohjans, M. Uslar, and D. Engel. Towards a model-driven-architecture process for smart grid projects. In P. Benghozi, D. Krob, A. Lonjon, and H. Panetto, editors, *Digital Enterprise Design & Management*, volume 261 of *Advances in Intelligent Systems and Computing*, pages 47–58. Springer International Publishing, 2014.

[28] R. Blaschke, S. Suhrer, and D. Engel. Serviceorientierte Architekturen für Smart Grids. In J. Hofmann and C. Felden, editors, *IT für Smart Grids*, volume 50 of *Praxis der Wirtschaftsinformatik*, pages 16–25. HMD, 2013. In German.

[29] D. Engel. Media encryption for still visual data. In D. Wagner, A. Bernstein, T. Dreier, S. Hoelldobler, G. Hotz, K.-P. Loehr, P. Molitor, G. Neumann, R. Reischuk, D. Saupe, M. Spiliopoulou, and H. Stoerrle, editors, *Ausgezeichnete Informatikdissertationen 2008*, Lecture Notes in Informatics, pages 81–90. Berlin: Springer, 2009. ISBN 978-88579-413-4.

[30] D. Engel, T. Stütz, and A. Uhl. Efficient transparent JPEG2000 encryption. In C.-T. Li, editor, *Multimedia Forensics and Security*, chapter 16, pages 336–359. Idea, 2007. ISBN 978-159904869-7.

Refereed Conference Proceedings

[31] A. Unterweger, F. Knirsch, C. Brunner, and D. Engel. Low-risk privacy-preserving electric vehicle charging with payments. In *Workshop on Automotive and Autonomous Vehicle Security (AutoSec)*, pages 1–6, Online, 2021. The Internet Society.

[32] C. Brunner, A. Madhusudan, D. Engel, and B. Preneel. Off-chain state channels in the energy domain. In *Proc. Power and Energy Society Innovative Smart Grid Technologies Conference (ISGT)*, Washington DC, USA, 2021. IEEE.

[33] C. Brunner, G. Eibl, P. Fröhlich, A. Sackl, and D. Engel. Who stores the private key? An Exploratory Study about User Preferences of Key Management for Blockchain-based Applications. In *Proceedings of the 7th International Conference on Information Systems Security and Privacy (ICISSP)*, Vienna, Austria, 2021. SciTePress.

[34] C. Brunner, U. Gallersdörfer, F. Knirsch, F. Matthes, and D. Engel. DID and VC: Untangling Decentralized Identifiers and Verifiable Credentials for the Web of Trust. In *Proceedings of the 3rd International Conference on Blockchain Technology and Applications (ICBTA 2020)*, Xi'an, China, 2020. ACM.

[35] C. Brunner, F. Knirsch, and D. Engel. SPROOF: A decentralized platform for attribute-based authentication. In P. Mori, S. Furnell, and O. Camp, editors, *Information Systems Security and Privacy*, pages 1–23, Cham, 2020. Springer International Publishing.

[36] F. Knirsch, A. Unterweger, M. Unterrainer, and D. Engel. Comparison of the Paillier and ElGamal Cryptosystems for Smart Grid Aggregation Protocols. In *Proceedings of the 6th International Conference on Information Systems Security and Privacy (ICISSP)*, pages 232–239, Valetta, Malta, 2020. SciTePress.

[37] C. Brunner, F. Knirsch, A. Unterweger, and D. Engel. A Comparison of Blockchain-based PKI Implementations. In *Proceedings of the 6th International Conference on Information Systems Security and Privacy (ICISSP)*, pages 333–340, Valetta, Malta, 2020. SciTePress.

[38] F. Knirsch, O. Langthaler, and D. Engel. Trust-less electricity consumption optimization in local energy communities. *Energy Informatics 2019*, 2(1):1–12, 2019.

[39] C. Brunner, F. Knirsch, and D. Engel. Sproof : A platform for issuing and verifying documents in a public blockchain. In *5th International Conference on Information Systems and Privacy (ICISSP)*, Prague, Czech Republic, 2019. SciTePress.

[40] A. Unterweger, S. Taheri-Boshrooyeh, G. Eibl, F. Knirsch, A. Küpçü, and D. Engel. Understanding Game-Based Privacy Proofs for Energy Consumption Aggregation Protocols. *IEEE Transactions on Smart Grid*, 10(5):5514–5523, 2019.

[41] F. Knirsch, D. Engel, and Z. Erkin. A fault-tolerant and efficient scheme for data aggregation over groups in the smart grid. In *Proceedings IEEE Workshop on Information Forensics and Security*, pages 1–6, 2017.

[42] J. Reichl, V. Azarova, D. Engel, C. Ferner, and A. Kolmann. Network tariff challenge: Who pays the piper? In *Meeting the Energy Demands of Emerging Economies, 40th IAEE International Conference*. International Association for Energy Economics, 2017.

[43] C. Promper, D. Engel, and R. C. Green. Anomaly detection in smart grids with imbalanced data methods. In *Symposium Series on Computational Intelligence*, pages 1–8, 12 2017.

[44] A. Aichhorn, A. Unterweger, D. Engel, and R. Mayrhofer. Investigating the Impact of Network Security on the Line Current Differential Protection System. In *2018 14th International Conference on Developments in Power System Protection (DPSP)*, Belfast, UK, 2018.

[45] A. Unterweger, F. Knirsch, C. Leixnering, and D. Engel. Lessons Learned from Implementing a Privacy-Preserving Smart Contract in Ethereum. In *2018 9th IFIP International Conference on New Technologies, Mobility and Security (NTMS)*, Paris, France, 2018. IEEE.

[46] G. Eibl, S. Burkhart, and D. Engel. Unsupervised Holiday Detection from Low-Resolution Smart Metering Data. In *Proceedings of the 4th International Conference on Information Systems Security and Privacy, ICISSP 2018*, pages 477–486. SciTePress, 2018.

[47] A. Aichhorn, A. Unterweger, D. Engel, and R. Mayrhofer. Investigating the Impact of Network Security on the Line Current Differential Protection System. *The Journal of Engineering*, 2018(15):1199–1203, 2018.

[48] J. Schwarzer, D. Engel, and S. Lehnhoff. Conceptual design of an agent-based socio-technical demand response consumer model. In *International Conference on Industrial Informatics*, pages 680–685, Porto, Portugal, 7 2018. IEEE.

[49] S. Burkhart, A. Unterweger, G. Eibl, and D. Engel. Detecting Swimming Pools in 15-Minute Load Data. In *IEEE International Conference on Trust, Security and Privacy in Computing and Communications 2018*, pages 1641–1655, New York, New York, USA, 8 2018. IEEE.

[50] K. Böhmer, F. Stertz, T. Hildebrandt, S. Rinderle-Ma, G. Eibl, C. Ferner, S. Burkhart, and D. Engel. Application and Testing of Business Processes in the Energy Domain. In *Fachtagung Datenbanksysteme für Business, Technologie und Web (BTW)*, pages 25–32, 2017.

[51] G. Eibl, C. Ferner, T. Hildebrandt, F. Stertz, S. Burkhart, S. Rinderle-Ma, and D. Engel. Exploration of the potential of process mining for intrusion detection in smart metering. In *3rd International Conference on Information Systems Security and Privacy*, 2017.

[52] A. Veichtlbauer, O. Langthaler, D. Engel, C. Kasberger, F. P. Andrén, and T. Strasser. Towards Applied Security-by-Design for DER Units. In *Proceedings of the 21st IEEE International Conference on Emerging Technologies and Factory Automation (ETFA 2016)*, 2016.

[53] C. Neureiter, M. Uslar, D. Engel, and G. Lastro. A standards-based approach for domain specific modelling of smart grid system architectures. In *Proceedings of International Conference on System of Systems Engineering (SoSE) 2016*, pages 1–6, Kongsberg, Norway, June 2016. Best Paper Award.

[54] J. Lückenga, D. Engel, and R. Green. Weighted vote algorithm combination technique for anomaly based smart grid intrusion detection systems. In *Proceedings of International Joint Conference on Neural Networks (IJCNN) 2016*, pages 2738–2742, Vancouver, Canada, July 2016.

[55] A. Unterweger, D. Engel, and M. Ringwelski. The effect of data granularity on load data compression. *Springer Lecture Notes in Computer Science – Energy Informatics 2015*, 9424:69–80, 2015.

[56] M. Uslar and D. Engel. Towards generic domain reference designation: How to learn from smart grid interoperability. In *Poster Proceedings of DACH Energy Informatics 2015*, pages 1–12, 2015.

[57] J. Schwarzer and D. Engel. Evaluation of data communication requirements for common demand response models. In *Proceedings of IEEE International Conference on Industrial Technology (ICIT) 2015*, pages 1311–1316, Seville, Spain, 2015. IEEE.

[58] M. Pichler, A. Veichtlbauer, and D. Engel. Evaluation of OSGi-based architectures for customer energy management systems. In *Proceedings of IEEE International Conference on Industrial Technology (ICIT) 2015*, pages 2455–2460, Seville, Spain, 2015. IEEE.

[59] G. Eibl, D. Engel, and C. Neureiter. Privacy-relevant smart metering use cases. In *Proceedings of IEEE International Conference on Industrial Technology (ICIT) 2015*, pages 1387–1392, Seville, Spain, 2015. IEEE.

[60] W. Lausenhammer, D. Engel, and R. Green. A game theoretic software framework for optimizing demand response. In *Proceedings of the 6th Conference on Innovative Smart Grid Technologies (ISGT)*, pages 1–5, Feb 2015.

[61] F. Knirsch, D. Engel, M. Frincu, and V. Prasanna. Model-based assessment for balancing privacy requirements and operational capabilities in the smart grid. In *Proceedings of the 6th Conference on Innovative Smart Grid Technologies (ISGT)*, pages 1–5, Feb 2015.

[62] F. Knirsch, D. Engel, C. Neureiter, M. Frincu, and V. Prasanna. Model-driven privacy assessment in the smart grid. In *Proceedings of the 1st International Conference on Information Systems Security and Privacy (ICISSP)*, pages 173–181, Feb 2015. Best Paper Award.

[63] C. Peer, D. Engel, and S. Wicker. Hierarchical key management for multi-resolution load data representation. In *Proceedings of 5th IEEE International Conference on Smart Grid Communications (SmartGridComm 2014)*, pages 926–932, Venice, Italy, Nov. 2014. IEEE.

[64] C. Neureiter, S. Rohjans, D. Engel, C. Dänekas, and M. Uslar. Addressing the complexity of distributed smart city systems by utilization of model driven engineering concepts. In *Proceedings VDE Kongress 2014*, pages 1–6, Oct. 2014.

[65] C. Neureiter, D. Engel, J. Trefke, R. Santodomingo, S. Rohjans, and M. Uslar. Towards consistent smart grid architecture tool support: From use cases to visualization. In *Proceedings of IEEE Innovative Smart Grid Technologies (ISGT) 2014*, Istanbul, Turkey, Oct. 2014. IEEE.

[66] N. Egger, C. Neureiter, and D. Engel. Adopting an SGAM based demand side management architecture for the realization of ambient assisted living. In *Proceedings VDE Kongress 2014*, pages 1–6, Oct. 2014.

[67] C. Dänekas, D. Engel, C. Neureiter, S. Rohjans, J. Trefke, and M. Uslar. Durchgängige Werkzeugunterstützung für das EU Mandat M/490: Vom Anwendungsfall bis zur Visualisierung. In *Proceedings VDE Kongress 2014*, pages 1–6, Oct. 2014. In German.

[68] C. Peuker and D. Engel. Praxistaugliche Kommunikationssicherheit in einer Smart Metering Infrastruktur. In J. Lüthi and H.-P. Steinebacher, editors, *Proc. 8. Forschungsforum der Österreichischen Fachhochschulen*, pages 72–76, 2014. In German.

[69] R. Blaschke and D. Engel. Flexible und sichere Integration von Smart Grid Use-Cases in einer serviceorientierten IKT-Architektur. In J. Lüthi and H.-P. Steinebacher, editors, *Proc. 8. Forschungsforum der Österreichischen Fachhochschulen*, pages 42–46, 2014. In German.

[70] G. Eibl and D. Engel. Influence of data granularity on nonintrusive appliance load monitoring. In *Proceedings of the Second ACM Workshop on Information Hiding and Multimedia Security (IH&MMSec '14)*, pages 147–151, Salzburg, Austria, 2014. ACM.

[71] J. Schwarzer, A. Kiefel, and D. Engel. The role of user interaction and acceptance in a cloud-based demand response model. In *Proc. IEEE IECON 2013, Special Session on Energy Informatics*, pages 4797–4802, Vienna, Austria, Nov. 2013. IEEE.

[72] C. Neureiter, G. Eibl, A. Veichtlbauer, and D. Engel. Towards a framework for engineering smart-grid-specific privacy requirements. In *Proc. IEEE IECON 2013, Special Session on Energy Informatics*, pages 4803 – 4808, Vienna, Austria, Nov. 2013. IEEE.

[73] D. Engel and G. Eibl. Multi-resolution load curve representation with privacy-preserving aggregation. In *Proceedings of IEEE Innovative Smart Grid Technologies (ISGT) 2013*, pages 1–5, Copenhagen, Denmark, Oct. 2013. IEEE.

[74] A. Veichtlbauer, D. Engel, F. Knirsch, O. Langthaler, and F. Moser. Advanced metering and data access infrastructures in smart grid environments. In *Proc. 7th International Conference on Sensor Technologies and Applications*, pages 63–68, Barcelona, Spain, Aug. 2013.

[75] D. Engel. Wavelet-based load profile representation for smart meter privacy. In *Proceedings IEEE PES Innovative Smart Grid Technologies (ISGT'13)*, pages 1–6, Washington, D.C., USA, Feb. 2013. IEEE.

[76] D. Engel, A. Uhl, and A. Unterweger. Region of interest signalling for encrypted jpeg images. In *Proceedings of the first ACM workshop on Information hiding and multimedia security (IHMMSEC '13)*, pages 165–174, Montpellier, France, 2013. ACM.

[77] S. Schinwald, D. Engel, and M. Seidler. Efficient automated liquid detection in microplates. In *Proceedings of 25th IEEE International Computer-Based Medical Systems (CBMS) Symposium*, pages 1–4, Rome, Italy, June 2012.

[78] D. Engel. Conditional access smart meter privacy based on multi-resolution wavelet analysis. In *Proceedings of the 4th International Symposium on Applied Sciences in Biomedical and Communication Technologies*, pages 45:1–45:5, New York, NY, USA, 2011. ACM.

[79] D. Engel, T. Stütz, and A. Uhl. Evaluation of JPEG2000 hashing for efficient authentication. In *Proceedings of International Conference on Multimedia & Expo, ICME '09*, pages 1728–1731, New York, NY, USA, June 2009.

[80] D. Engel, T. Stütz, and A. Uhl. Efficient transparent JPEG2000 encryption with format-compliant header protection. In *Proceedings of IEEE International Conference on Signal Processing and Communications, ICSPC '07*, Dubai, UAE, Nov. 2007.

[81] D. Engel, T. Stütz, and A. Uhl. Format-compliant JPEG2000 encryption with combined packet header and packet body protection. In *Proceedings of ACM Multimedia and Security Workshop, MM-SEC '07*, pages 87–95, Dallas, TX, USA, Sept. 2007.

[82] D. Engel and A. Uhl. An attack against image-based selective bitplane encryption. In *Proceedings of the IEEE International Conference on Image Processing, ICIP '07*, volume II, pages 141–144, San Antonio, TX, USA, Sept. 2007. IEEE.

[83] D. Engel and A. Uhl. An evaluation of lightweight JPEG2000 encryption with anisotropic wavelet packets. In E. J. Delp and P. W. Wong, editors, *Security, Steganography, and Watermarking of Multimedia Contents IX*, Proceedings of SPIE, pages 65051S1–65051S10, San Jose, CA, USA, Jan. 2007. SPIE.

[84] D. Engel, R. Kutil, and A. Uhl. A symbolic transform attack on lightweight encryption based on wavelet filter parameterization. In *Proceedings of ACM Multimedia and Security Workshop, MM-SEC '06*, pages 202–207, Geneva, Switzerland, Sept. 2006.

[85] D. Engel and A. Uhl. Lightweight JPEG2000 encryption with anisotropic wavelet packets. In *Proceedings of International Conference on Multimedia & Expo, ICME '06*, pages 2177–2180, Toronto, Canada, July 2006.

[86] S. Bertel, T. Barkowsky, D. Engel, and C. Freksa. Computational modeling of reasoning with mental images: basic requirements. In *Proceedings of the 7th International Conference on Cognitive Modeling (ICCM 2006)*, pages 50–55, Trieste, Italy, Apr. 2006.

[87] D. Engel and A. Uhl. Secret wavelet packet decompositions for JPEG 2000 lightweight encryption. In *Proceedings of the 31st International Conference on Acoustics, Speech, and Signal Processing, ICASSP '06*, volume V, pages 465–468, Toulouse, France, May 2006.

[88] D. Engel and A. Uhl. Security enhancement for lightweight JPEG 2000 transparent encryption. In *Proceedings of Fifth International Conference on Information, Communication and Signal Processing, ICICS '05*, pages 1102–1106, Bangkok, Thailand, Dec. 2005.

[89] D. Engel and A. Uhl. Parameterized biorthogonal wavelet lifting for lightweight JPEG 2000 transparent encryption. In *Proceedings of ACM Multimedia and Security Workshop, MM-SEC '05*, pages 63–70, New York, NY, USA, Aug. 2005.

[90] D. Engel, S. Bertel, and T. Barkowsky. Spatial principles in control of focus in reasoning with mental representations, images, and diagrams. In *Spatial Cognition IV. Reasoning, Action, and Interaction*, Lecture Notes in Computer Science, pages 181–203. Berlin: Springer, 2005.

[91] T. Barkowsky, S. Bertel, D. Engel, and C. Freksa. Design of an architecture for reasoning with mental images. In *Proceedings of the International Workshop on Spatial and Visual Components in Mental Reasoning about Large-scale Spaces*, Bad Zwischenahn, Germany, Sept. 2003.

[92] D. Engel and A. Uhl. Adaptive image compression of arbitrarily shaped objects using wavelet packets. In *Proceedings of the 23rd International Picture Coding Symposium 2003 (PCS 2003)*, pages 283–288, St. Malo, France, Apr. 2003.

[93] D. Engel and A. Uhl. Adaptive object-based image compression using wavelet packets. In *Proceedings of the 4th International Symposium on Video/Image Processing and Multimedia Communications (VIPromCom 2002)*, pages 183–187, Zadar, Croatia, June 2002.

Invited Papers (Non-refereed) and Other Non-refereed Contributions

[94] D. Engel, S. Huber, M. Leeb, M. C. Leitner, C. Rieß-Just, G. J. Oostingh, and K. Warta. Die strategische neuausrichtung der forschung an der fh salzburg im rahmen eines gesamthochschulischen organisationsentwicklungsprozesses. *fteval Journal for Research and Technology Policy Evaluation*, (56):1–15, 2024.

[95] D. Engel. Enhancing privacy in smart energy systems. *e & i Elektrotechnik und Informationstechnik*, 137:33–37, 2019.

[96] D. Engel. Privacy and security challenges in the smart grid user domain (invited talk). In *Proceedings of the first ACM workshop on Information hiding and multimedia security (IH&MMSec '13)*, pages 85–86, Montpellier, France, 2013. ACM.

[97] D. Engel. Privacy-preserving smart metering: Methods and applicability (invited talk). In *Proceedings of the fourth Workshop on Communications for Energy Systems*, pages 9–16, Vienna, Austria, Sept. 2013. Austrian Electrotechnical Association.

[98] F. Fredersdorf, J. Schwarzer, and D. Engel. Die Sicht der Endanwender im Smart Meter Datenschutz. *Datenschutz und Datensicherheit - DuD*, 39(10):682–686, 2015.

Patents

[99] M. Spitzlinger, A. Winter, W. Hinterhölzl, P. Eisenmann, K. Holzapfel, D. Engel, and J. Grünberger. Method for copy protection, Sony DADC, EP2010/003073, 2010.

Other Formats

[100] D. Engel. *Methods for User-Centric Smart Grid Privacy, Security and Control*. Habilitation treatise, Department of Computer Sciences, University of Salzburg, Austria, May 2017.

[101] D. Engel. *Media Encryption for Still Visual Data – An Analysis of Selected Techniques for Natural Images and Fingerprint Data in the Spatial and Wavelet Domain*. PhD thesis, Department of Computer Sciences, University of Salzburg, Austria, June 2008.

[102] D. Engel. *Modelling Self and Other – A Hybrid Approach to the Analysis of Images of Self and Other in the Radio Addresses Delivered by the American President Before and After 9/11*. Master thesis, Department of English and American Studies, University of Salzburg, Austria, 2004.

[103] D. Engel. *Adaptive Object-based Image Compression with Wavelet Methods*. Master thesis, Department of Scientific Computing, University of Salzburg, Austria, 2002.

[104] F. Knirsch, D. Engel, C. Neureiter, M. Frincu, and V. Prasanna. Model-driven privacy assessment in the smart grid. Technical Report 2014-01, Josef Ressel Center for User-Centric Smart Grid Privacy, Security and Control, July 2014.

[105] P. Eder, D. Engel, and A. Uhl. JPEG2000-based scalable video coding with MCTF. Technical report, Department of Computer Sciences, University of Salzburg, Austria, 2007.

[106] S. Bertel, T. Barkowsky, and D. Engel. The specification of the casimir architecture. Technical report, R1-[ImageSpace], SFB/TR8 Spatial Cognition; http://www.sfbtr8.uni-bremen.de/project/r1/, Bremen, Germany, 2004.

Salzburg, February 11, 2025