

# CURRICULUM VITAE

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## Experience

- 10/2023 - now **Bardehle Pagenberg**  
Patent attorney candidate specialized in communications, audio- and video coding, and IT  
Focus: Litigation, nullity, and prosecution of patents  
Supervising attorneys: Dipl.-Ing. Tobias Kaufmann, Dr. Tilman Müller, Dr. Volkmar Henke
- 10/2022 - 09/2023 **Dörries Frank-Molnia & Pohlman (df-mp)**  
Patent attorney candidate specialized in communications, video coding, and computer networks  
Focus: Litigation, nullity, and prosecution of patents  
Supervising patent attorney: Dr. Dominik Ho
- 03/2019 - 05/2019 **Université de Rennes 1**  
Research stay at the Mathematics Department (IRMAR)  
Collaborators: Dr. Pierre Loidreau, Prof. Dr. Julien Lavauzelle  
Research area: Attacks on IT security systems
- 11/2017 - 08/2022 **Technical University of Munich (TUM)**  
Scientist in the Coding and Cryptography (COD) group  
Supervisor: Prof. Dr.-Ing. Antonia Wachter-Zeh  
Research area: Post-quantum cryptography, applied coding theory
- 02/2017 - 10/2017 **NXP Semiconductors & Eindhoven University of Technology (TU/e)**  
Scientist in the Signal Processing Systems (SPS) group  
Supervisor: Prof. Dr. Frans Willems (TU/E), Dr. Francesco Laghezza (NXP)  
Research area: Digital communications embedded in automotive radars
- 03/2015 - 08/2015 **Rohde & Schwarz in Munich**  
Part-time engineer in the department 'Development of Baseband-HW and Signal Generators for Wireless Applications'  
Development and C++ implementation of automation and test routines
- 08/2013 - 10/2013 **Rosenberger High-Frequency Technology in Fridolfing**  
Intern in the department 'Research & Development'  
Measurement of cable-connector combinations with spectrum analyzers
- 04/2013 - 07/2014 **Technical University of Munich (TUM)**  
Student teaching assistant for 'Regelungssysteme 1' (Prof. Dr. Buss, SS 2014)  
Student teaching assistant for 'Ton- und Bildbearbeitung' (Prof. Dr. Rigol, SS 2013)

## Education

- 10/2020 - 08/2022 **M.Sc. in Management, Grade: 1.4 (US-equiv.: A, top 9%)**  
Technical University of Munich (TUM)  
Focus on capital markets and financial management  
Thesis: 'Machine Learning in Global Markets: A Private Investor Perspective' in collaboration with Prof. Dr. Horlemann (University of St.Gallen)
- 11/2017 - 11/2021 **Doktoringenieur, Grade: Magna cum laude (passed with great distinction)**  
Institute for Communications Engineering at Technical University of Munich (TUM)  
Focus on post-quantum cryptography and applied coding theory  
Dissertation: 'Post-Quantum Cryptography in the Hamming Metric, the Rank Metric, and the Sum-Rank Metric'
- 06/2014 - 12/2016 **M.Sc. in Electrical and Computer Engineering, Grade: 1.0 (US-equiv.: A+, top 3%)**  
Technical University of Munich (TUM)  
Focus on communication systems, information theory, and digital signal processing  
Thesis: 'Multidimensional Probabilistic Shaping for the Nonlinear Fiber Channel' in collaboration with Prof. Dr. Forchhammer (Technical University of Denmark)
- 08/2015 - 01/2016 **Master's student in Computer and Electrical Engineering, Grade: 12 (US-equiv.: A+)**  
Technical University of Denmark (DTU)  
Focus on C++, machine learning, pattern recognition, optimization, data fitting
- 05/2011 - 06/2014 **B.Sc. in Electrical and Computer Engineering, Grade: 1.5 (US-equiv.: A, top 7%)**  
Technical University of Munich (TUM)  
Focus on communication technology and digital signal processing  
Thesis: 'Quantization of Log-Likelihood-Ratios in MIMO Systems'

2016/2017	<b>Deutschlandstipendium at Technical University of Munich (TUM)</b> Scholarship for young outstanding talents at TUM Sponsorship by Rheinmetall
2016	<b>FIT weltweit Stipendium</b> Performance-related scholarship for international research stays Sponsorship by German Academic Exchange Service (DAAD)
2015/2016	<b>Deutschlandstipendium at Technical University of Munich (TUM)</b> Scholarship for young outstanding talents at TUM Sponsorship by MAN Truck & Bus Company
2014/2015	<b>Deutschlandstipendium at Technical University of Munich (TUM)</b> Scholarship for young outstanding talents at TUM Sponsorship by Wipro Technologies

## Additional Skills and Interests

Linux servers	Virtualization management, self-hosted VPN, DNS resolution, cloud storage, etc.
Programming	C/C++, Git, $\LaTeX$ , Matlab, Python, SageMath, VHDL
Languages	German (native language), English (fluent, both written and spoken)
Leisure activities	Tennis (e.g., taster courses for grad-schoolers, organization of league games), Cooking
Certificates	Tennis coach certificate received from the Bavarian Tennis Association Certificate for Teaching in Higher Education of the Bavarian Universities

## Peer-Reviewed Publications

Over the years, I have collaborated with more than 20 engineers, mathematicians, and computer scientists, who are from over 10 different countries. They were working in academia, in the industry, or at defense organizations. These collaborations led to peer-reviewed journal and conference papers as well as patent applications in the areas of IT security, applied coding theory, communications engineering, and radar sensing. The order of the authors on my papers was not always consistent — depending on the co-authors, the author names were occasionally ordered alphabetically.

### Journal Publications

1. Sven Puchinger, Julian Renner, and Johan Rosenkilde. “Generic Decoding in the Sum-Rank Metric”. In: *IEEE Trans. Inf. Theory* 68.8 (2022), pp. 5075–5097
2. Hannes Bartz, Lukas Holzbaur, Hedongliang Liu, Sven Puchinger, Julian Renner, and Antonia Wachter-Zeh. “Rank-Metric Codes and Their Applications”. In: *Found. Trends Commun. Inf. Theory* (2022)
3. Julian Renner, Sven Puchinger, and Antonia Wachter-Zeh. “LIGA: A Cryptosystem Based on the Hardness of Rank-Metric List and Interleaved Decoding”. In: *Des. Codes Cryptogr.* 89.6 (2021), pp. 1279–1319
4. Julian Renner, Alessandro Neri, and Sven Puchinger. “Low-Rank Parity-Check Codes over Galois Rings”. In: *Des. Codes Cryptogr.* 89.2 (2021), pp. 351–386
5. Julien Lavauzelle and Julian Renner. “Cryptanalysis of a System Based on Twisted Reed–Solomon Codes”. In: *Des. Codes Cryptogr.* 88.7 (2020), pp. 1285–1300
6. Julian Renner, Tobias Fehenberger, Metodij P. Yankov, Francesco Da Ros, Søren Forchhammer, Georg Böcherer, and Norbert Hanik. “Experimental Comparison of Probabilistic Shaping Methods for Unrepeated Fiber Transmission”. In: *J. Lightw. Technol.* 35.22 (2017), pp. 4871–4879

### Patents

1. Francesco Laghezza, Julian Renner, Frans Willems, Semih Serbetli, and Alex Alvarado. “Radar Sensing”. Pat. EP3734320. 2020

### Conference Publications

1. Nicolas Aragon, Victor Dyesryn, Philippe Gaborit, Pierre Loidreau, Julian Renner, and Antonia Wachter-Zeh. “LowMS: a new rank metric code-based KEM without ideal structure”. In: *Des. Codes Cryptogr.* (2023)
2. Sebastian Bitzer, Julian Renner, Antonia Wachter-Zeh, and Violetta Weger. “Generic Decoding in the Cover Metric”. In: *IEEE Inf. Theory Workshop (ITW)*. 2023, pp. 243–247

3. Anmoal Porwal, Lukas Holzbaur, Liu, Julian Renner, Antonia Wachter-Zeh, and Violetta Weger. "Interleaved Prange: A New Generic Decoder for Interleaved Codes". In: *Int. Conf. Post-Quantum Cryptogr. (PQCrypto)*. 2022, pp. 69–88
4. Thomas Schamberger, Lukas Holzbaur, Julian Renner, Antonia Wachter-Zeh, and Georg Sigl. "A Power Side-Channel Attack on the Reed-Muller Reed-Solomon Version of the HQC Cryptosystem". In: *Int. Conf. Post-Quantum Cryptogr. (PQCrypto)*. 2022, pp. 327–352
5. Anna-Lena Horlemann, Sven Puchinger, Julian Renner, Thomas Schamberger, and Antonia Wachter-Zeh. "Information-Set Decoding with Hints". In: *Int. Workshop Code-Based Cryptogr. (CBCrypto)*. 2021, pp. 60–83
6. Julian Renner, Sven Puchinger, and Antonia Wachter-Zeh. "Decoding High-Order Interleaved Rank-Metric Codes". In: *IEEE Int. Symp. Inf. Theory (ISIT)*. 2021, pp. 19–24
7. Sven Puchinger, Julian Renner, Antonia Wachter-Zeh, and Jens Zumbärgel. "Efficient Decoding of Gabidulin Codes over Galois Rings". In: *IEEE Int. Symp. Inf. Theory (ISIT)*. 2021, pp. 25–30
8. Julian Renner, Thomas Jerkovits, Hannes Bartz, Sven Puchinger, Pierre Loidreau, and Antonia Wachter-Zeh. "Randomized Decoding of Gabidulin Codes Beyond the Unique Decoding Radius". In: *Int. Conf. Post-Quantum Cryptogr. (PQCrypto)*. 2020, pp. 3–19
9. Sven Puchinger, Julian Renner, and Johan Rosenkilde. "Generic Decoding in the Sum-Rank Metric". In: *IEEE Int. Symp. Inf. Theory (ISIT)*. 2020, pp. 54–59
10. Julian Renner, Sven Puchinger, Antonia Wachter-Zeh, Camilla Hollanti, and Ragnar Freij-Hollanti. "Low-Rank Parity-Check Codes over the Ring of Integers Modulo a Prime Power". In: *IEEE Int. Symp. Inf. Theory (ISIT)*. 2020, pp. 19–24
11. Thomas Schamberger, Julian Renner, Georg Sigl, and Antonia Wachter-Zeh. "A Power Side-Channel Attack on the CCA2-Secure HQC KEM". in: *Smart Card Res. Adv. Appl. (CARDIS)*. 2021, pp. 119–134
12. Johannes Kunz, Julian Renner, Georg Maringer, Thomas Schamberger, and Antonia Wachter-Zeh. "On Software Implementation of Gabidulin Decoders". In: *Int. Workshop Alg. Comb. Coding Theory (ACCT)*. 2020, pp. 95–101
13. Julian Renner, Thomas Jerkovits, and Hannes Bartz. "Efficient Decoding of Interleaved Low-Rank Parity-Check Codes". In: *Int. Symp. Probl. Redundancy Inf. Control Syst. (REDUNDANCY)*. 2019, pp. 121–126
14. Julian Renner, Sven Puchinger, and Antonia Wachter-Zeh. "Interleaving Loidreau's Rank-Metric Cryptosystem". In: *Int. Symp. Probl. Redundancy Inf. Control Syst. (REDUNDANCY)*. 2019, pp. 127–132
15. Sven Puchinger, Julian Renner, and Antonia Wachter-Zeh. "Twisted Gabidulin Codes in the GPT Cryptosystem". In: *Int. Workshop Alg. Comb. Coding Theory (ACCT)*. 2018
16. Antonia Wachter-Zeh, Sven Puchinger, and Julian Renner. "Repairing the Faure–Loidreau Public-Key Cryptosystem". In: *IEEE Int. Symp. Inf. Theory (ISIT)*. 2018, pp. 2426–2430

Munich, 12/8/2024

