Fabian Lackner

Personal Data

Birth:	Austria, Villach | 20th May 1988
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Profile

- Systems Engineer combining a deep background in computational physics with hands-on experience developing secure, real-time software for safety-critical embedded systems.
- Expertise in C/C++, real-time concurrent programming (RTOS), and hardware-in-the-loop debugging, coupled with secure coding practices and vulnerability analysis.
- Deep mathematical and algorithmic foundation in numerical PDEs, stochastic methods, and large-scale physical simulations.
- Experienced with AI systems, from training physics-informed neural networks via PyTorch to designing multi-agent systems and workflows.

Work Experience

Jul 2026
May 2020-

Embedded Software Engineer at Elektrobit, Austria

- Developed MISRA-C conformant software modules that implement security protocols (TLS, IPsec/IKE, MACsec/MKA) for automotive Ethernet stacks shipped in cars worldwide.
- Conducted hands-on security reviews and penetration testing on embedded targets. Evaluated threat vectors and scored vulnerabilities (CVSS) to harden the software stack.
- Executed unit, integration, and system-level testing. Applied static analysis, fuzzing, and code coverage analysis. Ensured ASPICE-compliant requirement traceability.
- Debugged (Trace32, GDB), profiled, and optimized real-time preemption and concurrency on automotive ECUs.
- Maintained CI/CD release pipelines (Jenkins, Git) and customer support for integration and production.

May 2020
Oct 2017-

University Assistant at Vienna University of Technology

- Lectured bachelor/master courses and supervised thesis projects in computational physics.
- Developed a general-purpose high-performance simulation program for quantum many-body systems.

Oct 2017
Mar 2014-

Project Assistant (PhD) at Vienna University of Technology

- Simulation of laser-matter interaction – novel many-body methods, numerical computing (C++/Fortran), HPC clusters.

Summers
2009 & 2010-

Student Apprentice at Austrian Institute of Technology

- CFD and heat transfer simulations (Star-CCM+) of water cooling systems in EV power electronics (2010) and moisture droplet condensation in vehicle headlight chambers (2009).

Special Engagements & Leaves

May 2025
May 2024-

Educational and Paternity Leave

- Educational leave focused on Computer Science, Gen AI, and Deep Learning (May 2024 - Jan 2025).
- Paternity leave (Jan 2025 - May 2025).

Jun 2023
Mar 2023-

Company Visit at Argus Cyber Security, Tel Aviv

- Engineered TCAM-based hardware-accelerated firewalls for high-performance packet filtering and security policy lookups.

Apr 2017
Oct 2016-

Research Visit at the University of Tokyo

- Research collaboration on advanced propagation techniques to handle strong-field excitation of heavy atoms.

Education

2023- **Additional Graduate Coursework (Master Computer Engineering)**
- Vienna University of Technology (TU Wien)
- Focus: Operating systems, formal methods, signal processing, and deep learning. 53.5 ECTS completed.

2014-2017 **PhD (Dr. techn.)**
- Vienna University of Technology (TU Wien)
- Thesis: Time-dependent two-particle reduced density matrix theory: application to multi-electron atoms and molecules in strong laser pulses. Passed with distinction.
- Supervisors: Joachim Burgdörfer and Iva Brezinova (Institute for Theoretical Physics).

2011-2014 **Master Technical Physics**
- Vienna University of Technology (TU Wien)
- Focus: Computational physics and simulation. Passed with distinction.

2006-2011 **Bachelor Technical Physics**
- Vienna University of Technology (TU Wien)
- Focus: Semiclassical and classical mechanics. Passed with distinction.

Teaching

2018-2020 **Lecturer** – Statistical Mechanics 1/2 · Analytical Mechanics
2011-2013 **Tutor** – Statistical Mechanics 1/2 · Quantum Mechanics 1/2
2009-2010 **Tutor** – Electrodynamics · Quantum Mechanics 1/2 · Mathematical Methods of Physics

Scholarships and Awards

2014 Excellent Master Thesis Award of the City of Vienna
2014 Member of the **FWF Doctoral Program** Solids4Fun (Building Solids for Function)
2015 Associate Member of the **Int. Max Planck Research School** for Advanced Photonic Science

Selected Talks, Publications & Books

Talks 2017: 30th International Conference on Photonic, Electronic and Atomic Collisions, Cairns (Australia); 2019: 13th European Conference on Atoms, Molecules and Photons, Florence (Italy).

Publications 2017: **F. Lackner**, I. Brezinova, T. Sato, K. Ishikawa, and J. Burgdörfer, High-harmonic spectra from time-dependent two-particle reduced-density-matrix theory, Phys. Rev. A 95, 033414.
2013: **F. Lackner**, I. Brezinova, F. Libisch, and J. Burgdörfer, Semiclassical wave functions for open quantum billiards, Phys. Rev. E 88, 022916.

Book 2026: **Analytical Mechanics** (World Scientific), with Joachim Burgdörfer and Florian Libisch.

Technical Expertise

Languages:	C/C++ (10+ years), Python, Rust, Fortran, Julia, Java, JS, Bash
Embedded & Systems:	RTOS, STM32, HSM, Trace32 (debugging, profiling), GDB, assembly
Security & Net:	Applied cryptography, IPsec/MACsec, TLS, CVSS, OpenSSL, strongSwan
AI & Robotics:	PyTorch, CUDA, ROS 2, SLAM, LLM APIs, MCP, agentic frameworks
Infrastructure:	Linux, Docker, Jenkins, Git, CMake/Make, CI/CD

Languages & Interests

Languages: German (Native), English (Fluent), Italian (Basic)

Interests: FPV Quadcopters (Build & Flight), Custom PCB Design, Observational Astronomy, Wakeboarding, Combination Puzzles