



Dr.-Ing. Sebastian Zickau

Innovation Architect & Senior Research Scientist

*"Roads? Where we're going, we don't need roads."
Dr. Emmett Brown*

Professional Experience

2021–2024 **IT-Architect for the Digital Identity R&D project IDunion (BMWK)**, AMT FÜR INFORMATIONSVERRARBEITUNG, City of Cologne, Germany.

- Leading the R&D project IDunion funded by the BMWK, steering the team toward innovative digital identity solutions.
- Serving as a technical lead architect, pioneering the integration of digital verifiable credentials within the infrastructure of the City of Cologne.
- Conducting requirements engineering for various use cases, ensuring precise and actionable specifications.
- Facilitating communication with internal and external project partners, including ministries, fostering collaboration and alignment. Managed a team of four project members, pragmatically guiding the project direction and promoting a productive work environment.
- Overseeing the deployment and maintenance of server services, including container-based applications such as a Hyperledger Indy node, issuer and verifier agent software, and API interface suites for internal and external developers.
- Performing security analyses and evaluations of protocols, formats, schemes, and containers, ensuring robust protection measures. Key areas included OpenID4VC, W3C verifiable credentials, SD-JWTs, Hyperledger AnonCreds, Aries, Indy.
- Reporting project progress to the ministry, maintaining transparency and accountability.
- Actively participating in national and international conferences, conventions, and meetings, contributing to and learning from the identity community.
- Authoring proposals for project extensions, securing the continuation of funding and support.
- Publishing articles and papers in national and international contexts, establishing leadership in the field.
- Recommending future applications for digital credentials within the City of Cologne, guiding technological advancement, by supporting the eIDAS 2.0, OZG, FIM, and EfA processes, ensuring compliance and alignment with regulatory standards.
- Delivering internal presentations on applied cryptography and quantum computing, sharing expertise and fostering knowledge growth within the organization.

2012–2020 **Research Assistant & Doctoral Candidate**, TECHNISCHE UNIVERSITÄT BERLIN, TELEKOM INNOVATION LABORATORIES, Berlin, Germany.

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- Successfully led and completed six research projects funded by German and EU sources, achieving notable outcomes:
 - Developed and implemented various research prototypes, including collaborations with the Telekom Innovation Laboratory (T-Labs).
 - Submitted and secured funding for six out of over thirty project proposals across Germany (BMBF, BMWi) and the EU (Horizon 2020, EIT), attracting over €2.56 million in funding. • Published twenty research papers in international conferences, national journals, and book chapters, and delivered presentations at more than ten international research conferences, including IEEE events. • Supervised and mentored a team of new researchers and assistants, enhancing project communication with national and international funding parties and partners, and overseeing the full project reporting life cycle.
 - Hold the research role in the completion of the following R&D projects: SSI4de (Self-Sovereign Identity for Germany), GRAVITY, CityBeamer, DIMS (Decentralized Identity Management System), IdentityChain, PARADISE (Privacy-enhancing And Reliable Anti-Doping Integrated Service Environment), Curcuma (Cloud Computing Location Metadata), and TRESOR (TRusted Ecosystem for Standardized and Open cloud-based Resources).
 - Contributed to academic development by supervising over twenty theses (Master, Bachelor, and Diploma), conducting exams, and leading courses in Internet of Services Lab, Usable Privacy, and Business Processes and IT Services.
 - Enhanced public engagement and knowledge exchange through organizing and presenting at national research meetups, international hackathons, and project presentations.
- 2008–2010 **Research Assistant**, UNIVERSITY OF READING, Intelligent Media Systems & Services Research Centre (IMSS), School of Systems Engineering, Reading, England.
- 2003–2007 **Research Employee**, TU BERLIN, tubIT - IT Service-Center.
- 2000–2002 **Student Assistant**, TU BERLIN, PRZ - Prozessrechner Zentrale.

Education

- 2023 **SCRUM Master & Product Owner (Part I+II)**, ICO - INTERNATIONAL CERTIFICATION ORGANIZATION.
- 2022 **Doctorate (Dr.-Ing.)**, TECHNISCHE UNIVERSITÄT BERLIN, SERVICE-CENTRIC NETWORKING, Thesis title: Privacy-preserving Geofencing.
- 2016 **Software Campus Graduate**, TU BERLIN, TELEKOM INNOVATION LABORATORIES, BMBF, Including training courses: Leadership as a Lifestyle • Conflicts in Leadership Situations • Creativity & Innovation • Foundations of Scenario Planning • Intercultural Awareness • Reviving Creative Potentials .
- 2002 **Diploma in Computer Science (Dipl.-Inform.)**, TU BERLIN.
- 1995 **Abitur**, OBERSTUFENZENTRUM FÜR ELEKTRO- UND ENERGIETECHNIK, Berlin.

Research Topics & Interests

Privacy-enhancing technologies • digital verifiable credentials • applied cryptography • attribute-based encryption • cryptographic hash functions • zero-knowledge proofs • multi-party computation • quantum computing • distributed ledger technologies • private set intersection • location-based services • positioning and geo encoding systems • linked data, semantics and ontologies