

# DR. ALEX EL-SHAIKH

Technical Project Lead • Software Architect  
PhD in Computer Science



alex@el-shaikh.com Frankfurt am Main, Germany www.el-shaikh.com alexelshaikh

## PROJECT & DELIVERY

Coordination  
Project Coordination  
Stakeholder Alignment  
Requirements Engineering  
Risk & Dependency Management  
Technical Decision-Making

Architecture  
Software Architecture  
Backend Systems  
Cloud Architecture

Technical Foundation  
Java / Spring Boot  
PostgreSQL / SQL  
AWS  
Docker / Kubernetes

## PROFILE

Technical project lead and software architect with a PhD in Computer Science. Experience coordinating interdisciplinary software and research initiatives, aligning stakeholders and requirements, and guiding delivery through technical decisions, risk and dependency management and hands-on engineering.

## PROFESSIONAL EXPERIENCE

**Software Developer** 08/2026 – Present  
Hessische Zentrale für Datenverarbeitung (HZD) • Wiesbaden, Germany

- Architectural design of the database and persistence layer for the modernisation of tax systems used nationwide across Germany, including persistence-flow modelling and migration of the legacy system.
- Technical modernisation through cloud integration, focusing on secure and efficient processes and additional capabilities to support fraud prevention and detection.

**Senior Software Engineer** 04/2026 – 07/2026  
Accelerated Solutions GmbH • Frankfurt am Main, Germany

- Coordinated implementation across requirements, architecture and development; supported delivery through technical decisions, reviews and mentoring.
- Contributed hands-on to Java / Spring Boot backend development, AWS integration and performance optimisation.

**Postdoctoral Researcher** 02/2025 – 02/2026  
Imperial College London • London, United Kingdom

- Coordinated interdisciplinary work across computer science, biology and chemistry, aligning requirements and technical concepts.
- Led the technical design and evaluation of DNA-based storage architectures and economic models.

**Research Fellow** 11/2019 – 12/2024  
Philipps-Universität Marburg • Marburg, Germany

- Owned research and software topics end-to-end; coordinated student projects and theses from planning through delivery.
- Developed software architectures for random access, indexing and query processing.

LANGUAGES

|         |        |
|---------|--------|
| German  | Native |
| Arabic  | Native |
| English | Fluent |

SELECTED HIGHLIGHTS

- 🏆 Best Workshop Paper Award, BTW NoDMC 2023
- 🏆 Editor's Choice, NAR Genomics and Bioinformatics (2022)

EDUCATION

|                                        |                                           |
|----------------------------------------|-------------------------------------------|
| 📅 2019 – 2024                          | Dr. rer. nat. in Computer Science         |
| 📍 Philipps-Universität Marburg Marburg | Final grade: 1.0 • <i>magna cum laude</i> |
| 📅 2016 – 2019                          | M.Sc. Computer Science                    |
| 📍 Philipps-Universität Marburg Marburg |                                           |
| 📅 08/2016 – 12/2016                    | ERASMUS Semester                          |
| 📍 Aalto University Helsinki, Finland   |                                           |
| 📅 2012 – 2015                          | B.Sc. Computer Science                    |
| 📍 Philipps-Universität Marburg Marburg |                                           |

SELECTED PROJECT EXPERIENCE

|                                                                                                                                                                   |                                   |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|
| <b>DNAContainer &amp; Query Architecture</b>                                                                                                                      | Marburg / Imperial College London |
| Translated interdisciplinary requirements into an object-based storage and query architecture and coordinated technical dependencies and student contributions.   |                                   |
| <b>High-Scale Random Access</b>                                                                                                                                   | Research & Software Development   |
| Owned the technical development and evaluation of scalable random-access mechanisms, expanding the addressable object space from hundreds to millions.            |                                   |
| <b>Cloud Backend &amp; Performance</b>                                                                                                                            | Accelerated Solutions GmbH        |
| Supported technical delivery across architecture, backend, AWS integration and performance; used reviews and technical decisions to keep implementation on track. |                                   |

RESEARCH & INNOVATION

Multiple first-author publications on DNA-based data storage, including *Scientific Reports* and *NAR Genomics and Bioinformatics*.

TEACHING & STUDENT SUPERVISION

Teaching in databases, software engineering and algorithms; supervision and coordination of Bachelor's and Master's theses.