

Curriculum Vitae

Jakob Szarkowicz

Personal Information

Full Name	Jakob Szarkowicz
Address	Altenbeken, 33100 Paderborn, Germany
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Phone	Available upon request
Date of Birth	27 December 2006, Paderborn, Germany
Nationality	German
Languages	German (Native), English (Fluent – C1), French (Upper-Intermediate – B2), Polish (Upper-Intermediate – B2)

Professional Objective

Dedicated Computer Science student with strong passion for **Quantum Computing**, **Theoretical Computer Science**, and **Formal Methods**. Seeking to leverage expertise in discrete mathematics, formal logic, and software engineering to contribute to cutting-edge research and development in quantum information systems, formal verification, and computational theory. Committed to continuous learning and collaborative innovation in high-performance computing environments.

Education

Bachelor of Science in Computer Science

University of Paderborn, Germany
October 2025 – September 2028 (In Progress)

- **Academic Focus:** Quantum Computing, Theoretical Informatics, Formal Logic and Methods

- **Core Coursework (1st Semester):**
 - **Programming 1 (Imperative & Object-Oriented Paradigms):** Fundamental programming concepts including control flow, loops, functions, variable semantics, and functional decomposition
 - **Discrete Mathematics:** Mathematical logic foundations, combinatorics, proof methodologies (direct proof, proof by contradiction, induction), propositional and predicate calculus
 - **Linear Algebra & Analytic Geometry I:** Vector spaces, basis determination in subspaces, dimensionality analysis, linear transformations, eigenvalue problems
 - **Fundamentals of Technical Informatics:** Digital circuit design, Boolean algebra, processor architecture, memory hierarchies
 - **Curricular Engagement:** Active participation in university study groups focusing on mathematical depth, algorithmic complexity, and formal systems
 - **Expected Graduation GPA:** First-class honors with specialization in theoretical foundations
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Abitur (General University Entrance Qualification)

Goerdeler-Gymnasium, Paderborn, Germany

August 2017 – June 2025

- **Advanced Placement Courses:** Mathematics, Computer Science, History
 - **Specializations:**
 - **Mathematics:** Differential and integral calculus, analytic geometry, stochastic methods, formal mathematical proofs
 - **Computer Science:** Algorithmic problem-solving, object-oriented programming (Python), data structure fundamentals, formal systems and automata theory
 - **History:** European and German history, contemporary history, critical engagement with primary sources and historiographical debate
 - **Extracurricular Achievement:**
 - Active participant in school mathematics and computer science study circles
 - Participant in historical workshops on contemporary issues (e.g., Jewish Life in Germany: Perspectives and Challenges)
 - Authored reflective analytical report on workshop content for advanced history coursework
 - Achieved qualification with distinction in STEM subjects
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Scholarships and Academic Recognition

Fellow, Studienstiftung des deutschen Volkes

Since January 2026

- **Academic Advisor:** Prof. Dr. Harry Kullmann, University of Paderborn
 - **Programme Focus:** Individualized academic mentoring, networking with high-achieving students across Germany, interdisciplinary professional development
 - **Status:** Recently admitted; inaugural meeting scheduled for January 7, 2026
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Professional Experience

Lifeguard & Swimming Instructor

Since 2024

- **Institution:** Public Swimming Facilities, Paderborn
- **Responsibilities:**
 - Provision of water safety and rescue operations (certified to DLRG standards)
 - Instruction in swimming technique across skill levels (freestyle, breaststroke, backstroke, diving) for children and adults
 - Supervisory responsibilities and emergency response management
 - Performance monitoring and progression planning for trainees
 - CPR/First Aid instruction and certification
- **Professional Qualifications:**
 - Rettungsschwimmer-Lizenz (German Lifeguard Certification, DLRG)
 - Erste Hilfe / BLS Certification (First Aid & Basic Life Support)
- **Transferable Skills:** Responsibility, situational decision-making, pedagogical communication, crisis management

Private Tutoring – Mathematics & Computer Science

2023 – Present

- **Student Population:** Secondary School Level I & II (ages 13–18)
- **Subject Areas:**
 - **Mathematics:** Linear algebra, differential calculus, analytic geometry, number systems, formal logic and set theory
 - **Computer Science:** Programming logic, data structures and algorithms, computational thinking, foundational Python
- **Pedagogical Approach:** Emphasis on conceptual understanding over memorization; differentiated instruction adapted to individual learning profiles
- **Instructional Tools:** Anki spaced-repetition systems, LaTeX-based problem documentation, interactive visualizations
- **Outcomes:** Consistent improvement in student comprehension and exam performance

Technical Competencies

Programming Languages & Software Engineering

Language / Framework	Proficiency Level	Application Context
Python 3.x	Advanced	Data processing, scientific computing, automation scripts, tool development, algorithm implementation
LaTeX	Advanced	Academic documentation, mathematical typesetting, problem-set creation, Anki flashcard generation
JavaScript (ES6+)	Intermediate–Advanced	Web prototypes, DOM manipulation, asynchronous programming, web API integration
PowerShell	Intermediate	Systems administration, batch automation, infrastructure scripting, Windows automation
BASH / Shell	Intermediate	Unix/Linux command-line operations, text processing (grep, sed, awk), script automation

Software Tools & Development Environment

- **Version Control & Collaboration:** Git, GitHub (repositories, branching strategies, pull requests, collaborative development)
- **Code Editors & IDEs:** Neovim (terminal-based, highly customized), VS Code, IntelliJ IDEA
- **Knowledge Management:** Obsidian (second-brain system), Zettelkasten methodology (Luhmann-inspired), Anki (spaced-repetition learning)
- **Containerization & DevOps:** Docker (containers, image building, basic orchestration), Azure DevOps fundamentals
- **Cloud & Networking:** Cloudflare Tunnels (network tunneling, secure access), basic cloud infrastructure principles
- **Self-Hosted Infrastructure:** Jellyfin (media server deployment), Ollama (local LLM deployment and inference)
- **Operating Systems:** macOS (primary daily driver), Debian-based Linux, Windows PowerShell scripting

Mathematics & Theoretical Computer Science

- **Linear Algebra:** Vector spaces and subspaces, basis computation, dimension analysis, linear transformations, eigenvalue decomposition, matrix analysis
- **Discrete Mathematics:** Propositional and predicate logic, formal proof techniques, combinatorial structures, recursive definitions, induction principles
- **Algorithm Theory:** Computational complexity analysis (Big O notation, time/space complexity), sorting and searching algorithms, introduction to graph theory and algorithms
- **Quantum Computing:** Theoretical foundations (qubits, superposition, quantum entanglement, quantum gates, quantum circuits), quantum algorithm basics—active research interest
- **Formal Logic & Verification:** Propositional logic, Resolution principle, SAT solver fundamentals, introduction to model checking

Professional Competencies

- **Interpersonal Communication:** Clear articulation of complex technical concepts to non-specialist audiences; adaptable explanation strategies
- **Structured Knowledge Management:** Systematic documentation using Zettelkasten; disciplined note-taking with emphasis on interconnection and synthesis
- **Self-Directed Learning:** Independent skill acquisition via online resources, open-source projects, peer collaboration; proactive engagement with emerging technologies
- **Cross-Cultural & Multilingual Competence:** Family and social network spanning multiple cultures; comfortable in international collaboration; proven language acquisition aptitude
- **Analytical Thinking:** Critical evaluation of learning processes, engagement with societal challenges, reflective professional goal-setting

Academic & Extracurricular Engagement

- **Research Interests:** Quantum computing algorithms, quantum error correction, formal verification of safety-critical systems, mathematical logic in AI safety
- **Digital Presence:** Active GitHub profile with documented projects and contributions to open-source software
- **Competitive Gaming:** Chess.com / FIDE Online Arena (Arena International Master, Elo ~1200), active in blitz and rapid formats
- **Professional Community:** Free and Open-Source Software (FOSS) community participant; interested in collaborative development practices

Additional Interests & Activities

Photography (Analog & Digital)

- **Specialization:** Documentary and reportage photography, everyday visual ethnography, aesthetic exploration
- **Technical Focus:** Optical design and characterization, vintage rangefinder and prime lens evaluation (e.g., Yashica ML 50mm f/1.7 and comparable classic optics)
- **Published Work:** Technical equipment reviews and comparative analyses on specialist photography platforms

Sport & Physical Activity

- **Swimming:** Competitive experience, endurance training, water rescue operations (see Professional Experience)
- **Climbing / Boulderling:** Regular outdoor climbing; risk assessment, team dynamics, physical problem-solving
- **General Fitness:** Sustained engagement with athletic performance and cardiovascular conditioning

Chess

- **FIDE Online Arena:** Arena International Master rating, active online competitor
- **Formats:** Blitz and rapid time controls
- **Study:** Opening theory, endgame analysis, positional strategy

Other Interests

- **Music:** R&B, Independent music, instrumental compositions
- **Media Consumption:** Anime and manga, international cinema, documentary films with sociological and technological focus
- **Motorsport:** Formula 1 fan with interest in technical engineering and strategic race analysis

Certifications & Professional Development

- **Rettungsschwimmer-Lizenz** (German Lifeguard Certification) – DLRG, valid current
- **Erste Hilfe / BLS Certification** (First Aid & Basic Life Support), current
- **Studienstiftung Fellowship** – Active scholarship holder as of January 2026

References

Available upon request

Last Updated: December 2025