# RAYK KRETZSCHMAR

in https://www.linkedin.com/in/rayk-kretzschmar/
⚬ https://github.com/RaykKretzschmar

* 10.May.1998 in Rodewisch

## Contact

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## Languages

German – native
English – C1
Spanish – A2
Russian – B2
Japanese – basic

## Hobbies

• Sports/ Handball
• Hightech products/ Smart Devices/ VR
• Investing

Master's student in Computational and Data Science with strong experience in NLP, information retrieval, and explainable AI. Skilled in developing open-source libraries, applying advanced machine learning techniques, and bridging theoretical research with real-world applications. Looking to contribute to innovative projects in AI and data science.

## Educational Background

**Master of Science Computational and Data Science**
2023 – early 2026
Specialization: NLP and Knowledge Graphs

Friedrich Schiller University Jena

**Bachelor of Science Bioinformatics**
2016 – 2023

Friedrich Schiller University Jena

2016
Higher education entrance qualification (A-levels)

Johann-Heinrich-Pestalozzi-Gymnasium Rodewisch

2013 – 2014
Completed one year of preliminary studies in computer science while attending a German secondary school (Gymnasium).

University of Applied Sciences Zwickau

# Work Experience

### Scientific Assistant | Friedrich Schiller University Jena, Webis Group
2025 – Present

- Developed and integrated new information retrieval models into the open-source LightningIR Python library.
- Conducted evaluations on benchmark datasets to validate model performance.
- Improved project usability by restructuring and extending comprehensive technical documentation.

### Scientific Assistant | Friedrich Schiller University Jena
2025

- Responsible for reviewing and evaluating weekly student submissions for the course "Efficient Computing/Parallel Computing II".
- Supervised the course's "Open Lab," where students developed hands-on projects using Raspberry Pi devices.

### Student Assistant | German Aerospace Center (DLR), Institute for Data Science
2024 – 2025

- Researched and developed methods in explainable AI to improve the interpretability and transparency of machine learning models.
- Explored innovative approaches bridging theoretical research and practical applications in real-world contexts.
- Contributed to cutting-edge projects ensuring accountable, effective, and understandable AI systems.

### Working Student | Convales Service GmbH, Digitization
2023

- Administered and customized the Atlassian Stack (Confluence, Jira) to align with internal requirements.
- Oversaw third-party system integrations and ensured smooth platform transitions.
- Processed and managed data through API-based workflows to support business operations.

### Technical Assistant | Physio logisch
2019 – 2022

- Technical support

# Projects

**GitHub:** https://github.com/RaykKretzschmar

**Master's Thesis:** "Evaluating Pre-Training Techniques for Single-Vector Encoder Models"

- Developed and evaluated contrastive learning, masked auto-encoding, and bag-of-words objectives for the TITE architecture.
- Improved retrieval effectiveness while reducing computational cost and environmental impact.

**Bachelor's Thesis:** "Applying Chemical Organization Theory to Economic Systems"

- Combined a theory from bioinformatics with economics, showcasing an interdisciplinary approach to problem-solving.
- Processed reaction networks from economic sectors to reveal critical industries and analyze the potential and limitations of the method.

### News Article Sentiment for Stock Market Prediction

- Analyzed sentiment from New York Times articles to determine if there was a correlation with the performance of the S&P 500 stocks.

### FewoVerwaltung

- A tool for managing customers for small businesses that rent out apartments.

### GravitySim

- An interactive gravity simulation using Pygame where users can create, move, and collide celestial bodies with realistic gravitational physics and dynamic collision fragmentation

## Additional Experience

**AI Summer School**

Bad Kösen, 2023

- An invitational one-week intensive course on AI for students from around the globe. Topics covered included deep learning, NLP, computer vision, and AI ethics.
- Participated in hands-on workshops and projects to apply knowledge to real-world problems.

**English Communication School**

Malta, 2016

- Studied English for 8 weeks and received a certificate for completion of a C1 level English course.
- Improved language skills and gained cultural experience by interacting with native speakers and people from around the world.

**Management Skills – Team Leadership Skills Masterclass**

Udemy, issued Apr 2025

- Skills: Team Management, Team Leadership, Lean Management, Charismatic Leadership, Team Building

**Computational Fluid Mechanics – Airflow Around a Spoiler**

Coursera, issued Mar 2024

- Skills: SimScale, Computational Fluid Dynamics (CFD), Computer Simulations

**The Data Science Course: Science Data Complete Bootcamp 2024**

Udemy, issued Mar 2024

- Skills: Python, Machine Learning, TensorFlow, Tableau