



## Aleksandar Anžel

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Born 06.08.1995.

 AAnzel

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 AleksandarAnzel

 Aleksandar Anžel

 <https://aanzel.github.io>

### WORK EXPERIENCE

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*October 2023 – present*

#### Postdoctoral Researcher

Robert Koch Institute, Centre for Artificial Intelligence in Public Health Research (ZKI-PH 5: Visualisation), Berlin

- Contributed to cutting-edge research and development efforts at the intersection of artificial intelligence (AI), machine learning, visualization, and public health. Collaborated with a multidisciplinary team of researchers to design and implement novel techniques for visualizing and explaining AI models in public health applications. Worked on improving existing visualization techniques used in public health AI models through analysis, evaluation, and proposing innovative solutions for enhanced user understanding and trust in AI systems. Conducted research and published findings in reputable scientific journals or presented at relevant international conferences.

*July 2022 – February 2023*

#### Technical Lead

eMedicals Healthtech GmbH, Frankfurt am Main

- Mentored and led two teams of 8 people to increase productivity and maximize product quality. Helped with discovering and hiring new team members. Assessed used technologies and advised on SOTA the team could use. Determined potential risks and proposed ways to mitigate them, thus providing GDPR compliant and secure internal platform. Asserted data compliance and ensured its proper adoption. Used Scrum methodology to help the product owner and acted as a Scrum Master. Designed and implemented application-critical parts of the *kidi* platform. Improved the performance of legacy code and decreased loading times by 40%. Reviewed the code of other team members and promoted collaboration and engagement between two teams. Provided architectural and design directions for the company's products and reinforced the company's goals. Guided the development according to multiple software-as-a-medical-product standards and conducted internal audits.

*October 2021 – July 2022*

#### Data Scientist

eMedicals Healthtech GmbH, Frankfurt am Main

- Used analytical, statistical, and programming skills to collect, analyze, and interpret large medical and biological data sets. Streamlined algorithm development, machine learning workflows (i.e., NLP and computer vision), and statistical techniques to produce solutions to problems quickly. Initiated automated testing efforts that reduced post production defects by 30%. Closely worked with university partners (i.e., Technische Universität Darmstadt) and research organizations (i.e., Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e.V.) to improve, evaluate, and further develop algorithms relevant to the company. Closely monitored SOTA AI and data science methods and technologies to support the evolution of the company's strategy.

December 2020 – September  
2023

## Research Associate

Heider Lab, Philipps-Universität Marburg, Marburg

- Developed bioinformatics and ML pipelines for solving various omics and multi-omics problems. Adapted existing and designed and implemented new visualization methods for biological and medical data sets. Organized and facilitated workshops, seminars, and lectures to empower and inspire students to reach their full potential. Mentored multiple undergraduate and graduate students during their studies and while conducting research. Introduced undergraduate and graduate students from various disciplines to good scientific practices and conventions.

MOSLA (*Molekulare Speicher zur Langzeit-Archivierung*), Philipps-Universität Marburg, Marburg

- Designed, implemented, and evaluated automatic workflows for information storage systems based on molecular storage media. Adapted existing and developed new visualization methods and UIs for novel data storage technologies. Systematically reviewed existing DNA storage tools and methods and promoted DNA as a data storage medium. Actively engaged with other domain specialists and supported and steered the research.

## EDUCATION

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December 2020 – present

### Ph.D. degree in Computer Science (*Dr. rer. nat.*)

Philipps-Universität Marburg, Faculty of Mathematics and Computer Science

- Anžel, A. (2023). *A Tale of Two Approaches: Comparing Top-Down and Bottom-Up Strategies for Analyzing and Visualizing High-Dimensional Data*. Philipps-Universität Marburg. 10.17192/z2023.0533

August 2021

### OxML summer school participant

Machine Learning Summer School, University of Oxford

October 2018 – January 2020

### Master's degree in Mathematics

#### Module: Computer Science and Informatics

University of Belgrade, Faculty of Mathematics

- Average grade: 10.00 (out of 10.00)
- Anžel, A. (2020). *Determining protein N-glycosylation with machine learning methods*. University of Belgrade, Faculty of Mathematics. elibrary.matf.bg.ac.rs

October 2014 – July 2018

### Bachelor's degree in Mathematics

#### Module: Computer Science and Informatics

University of Belgrade, Faculty of Mathematics

- Average grade: 8.66 (out of 10.00)

## SKILLS

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### Languages

Serbian – Native proficiency

English – Full professional proficiency

- Cambridge English: First (FCE): upper intermediate (B2 in CEFR)

German – Elementary proficiency

### Computer Science

Software Development

- C, Python, C++, Java, MATLAB, Shell, Haskell, Assembly IA-64, Assembly ARM-32

Machine Learning

- Keras, Tensorflow, Scikit-learn

Data Management

- SQL, NoSQL

### Additional skills

Scientific and Cluster Computing, High-Level Visualization, CI/CD, Containerization (Docker), Microsoft Azure, Agile development, Scrum, Code verification and validation

### Document manipulation

L<sup>A</sup>T<sub>E</sub>X, Libre Office Suite, Microsoft Office Suite

**Soft skills**    Excellent organizational and communication skills  
 Ability to work collaboratively with people at all professional levels  
 Thoroughness, with rigorous attention to both detail and quality

## PUBLICATIONS

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- 2023 • Anžel, A., Heider, D., & Hattab, G. (2023). *Interactive Polar Diagrams for Model Comparison*. Computer Methods and Programs in Biomedicine, 242, 107843. 10.1016/j.cmpb.2023.107843.
- Hattab, G., Anžel, A., Spänig, S., Neumann, N., & Heider, D. (01 2023). *A parametric approach for molecular encodings using multilevel atomic neighborhoods applied to peptide classification*. NAR Genomics and Bioinformatics, 5(1). 10.1093/nargab/lqac103
- 2022 • Anžel, A., Heider, D., & Hattab, G. (2022). *MOVIS: A multi-omics software solution for multi-modal time-series clustering, embedding, and visualizing tasks*. Computational and Structural Biotechnology Journal, 20, 1044–1055. 10.1016/j.csbj.2022.02.012
- 2021 • Anžel, A., Heider, D., & Hattab, G. (2021). *The Visual Story of Data Storage: From Storage Properties to User Interfaces*. Computational and Structural Biotechnology Journal, 1(1), 1. 10.1016/j.csbj.2021.08.031

## SOFTWARE PROJECTS

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- Bioinformatics**
- *Determining protein N-glycosylation with machine learning methods*
  - *Modification and analysis of UPGMA algorithm while using different metrics*
  - *MOVIS: A Multi-Omics Software Solution for Multi-modal Time-Series Clustering, Embedding, and Visualizing Tasks*
  - *CMANGOES – Carbon-based Multi-level AtomicNeighborhood Encodings*
- Computer Science**
- *Interactive Polar Diagrams for Model Comparison*
  - *Finding Waldo using various Machine Learning methods*
  - *Image modification and correction with Python*
  - *Determining integer variable ranges using Abstract Interpretation in C++ (LLVM, Clang)*
  - *AVL trees in C programming language*

## SELECTED EVENTS

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- 2023 • *Future Bioinformatics Workshop*. Herborn, Germany. (attendee)
- 2022 • *Future Bioinformatics Workshop*. Ebsdorfergrund, Germany. (presenter)
- *The 1st International Conference on Data Storage in Molecular Media*. Virtual. (attendee, co-host)
- 2021 • *IEEE Visualization Conference (VIS)*. Virtual. (attendee)
- *Bio+Med+Vis Spring School*. Virtual. (attendee)
- *Symposium on Interdisciplinary Bioinformatics and Biomedical Data Science (IBBMDS)*. Marburg, Germany. (presenter)
- 2020 • *IEEE Visualization Conference (VIS)*. Salt Lake City, Utah, USA. (attendee)
- *Eurographics & Eurovis (EGEV)*. Norrköping, Sweden. (attendee)

## TEACHING

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- 2022 – present • *Lecture, Machine Learning*. Department of Mathematics and Computer Science, University of Marburg. Marburg, Germany. (collaborator, tutor)
- 2022 • *Guest lecture, Molecules as storage media for long-term data storage*. Faculty of Mathematics, University of Belgrade. Belgrade, Serbia. (presenter)
- 2021 – 2022 • *Group student project (Projektarbeit), DNA Storage Encodings*. Department of Mathematics and Computer Science, University of Marburg. Marburg, Germany. (co-organizer, tutor)

- 2020 – 2022
- *Lecture, Data Visualization*. Department of Mathematics and Computer Science, University of Marburg. Marburg, Germany. (collaborator)
  - *Seminar, Information Theory Tools for Visual Computing*. Department of Mathematics and Computer Science, University of Marburg. Marburg, Germany. (co-organizer, presenter)

## ADVISING & SUPERVISION

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- November 2022 – present Bianca Thiel, M.Sc., Computer Science (CS). *Interactive Information-Theoretic Visualization for Plot Types*. Department of Mathematics and Computer Science, University of Marburg. Marburg, Germany.
- October 2022 – present Dilekcan Pamir, B.Sc., Computer Science (CS). *Qualitative and Quantitative Visualization of Soft-Tissue Registration Mediated with Isolines*. Department of Mathematics and Computer Science, University of Marburg. Marburg, Germany.
- June 2022 – October 2022 Jing Chen, B.Sc., Bioinformatics (BI). *Geospatial Visualization of Lake Microbiomes*. Department of Mathematics and Computer Science, University of Marburg. Marburg, Germany.
- October 2021 – November 2022 Fabio Rougier, M.Sc., Computer Science (CS). *Explainable Machine Learning – Visualization of Random Forests*. Department of Mathematics and Computer Science, University of Marburg. Marburg, Germany.

## REVIEWING

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- 2022 – present
- BMC Bioinformatics, ISSN: 1471-2105
  - Scientific Reports, ISSN: 2045-2322
  - BioData Mining, ISSN: 1756-0381
  - Bioinformatics Advances, ISSN: 2635-0041
  - Frontiers in Cellular and Infection Microbiology, ISSN: 2235-2988

## ADDITIONAL INFORMATION

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- Driving licence Category B (cars)
- Interests Technology, Research, Computer Science, Bioinformatics, Linux, FOSS, Science Fiction, Fantasy, The Matrix, Video games, Hiking