Bertan Karacora

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Education

M.Sc. in Computer Science — Oct. 2022 – Present
University of Bonn — *Bonn, Germany*

- Current grade average: 1.1/1.0 (degree-relevant modules)
- Focus areas: Image Analysis, Deep Learning, Signal Processing, Intelligent Systems
- Thesis pending, expected completion: April 2026

B.Sc. in Computer Science — Oct. 2018 – Sep. 2022
University of Bonn — *Bonn, Germany*

- Final grade: 1.7/1.0
- Thesis: *Inverse Rendering of Wave Optical BRDFs* (grade: 1.1/1.0)

General Qualification for University Entrance, "Abitur" — Jul. 2010 – Jun. 2018
Carl-Fuhlrott-Gymnasium (public secondary school) — *Wuppertal, Germany*

- Final grade: 1.4/1.0
- Awarded the MINT-EC Certificate with distinction

Experience

Student Teaching Assistant — Oct. 2025 – Mar. 2026
Computational Analytics Group, University of Bonn — *Bonn, Germany*

- Tutor for the course *Introduction to High Performance Computing* (Prof. Dr. Estela Suarez)

Student Research Assistant — Apr. 2024 – Sep. 2025
Autonomous Intelligent Systems Group, University of Bonn — *Bonn, Germany*

- Participated with team NimbRo at national and international RoboCup@Home competitions: RoboCup 2024 (Eindhoven, Netherlands, 1st place), RoboCup German Open 2025 (Nuremberg, 1st place), RoboCup 2025 (Salvador, Brazil, 2nd place)
- Integrated a fisheye lens camera system for domestic service robots with efficient dense depth estimation using GPU-based k-NN interpolation in 3D LiDAR pointclouds
- Built training and inference pipelines for DepthAnything V2 on embedded systems (Jetson Orin Nano)
- Integrated and optimized a state-of-the-art 2D LiDAR person detection method (DR-SPAAM)
- Designed and implemented a multi-sensor person detection, re-identification, and tracking pipeline including major adaptations of state-of-the-art methods
- Implemented and deployed the RoboCup@Home task "Help Me Carry" demonstrating person tracking, navigation and following, obstacle avoidance, person re-identification, grasping and carrying of objects

Student Teaching Assistant — Oct. 2022 – Mar. 2023
Technical Computer Science Group, University of Bonn — *Bonn, Germany*

- Tutor for the course *Computer Engineering* (Prof. Dr. Joachim Anlauf)

Working Student - Full-Stack Developer — Sep. 2020 – Sep. 2022
Pixelrein GmbH & Co. KG — *Bonn, Germany*

- Developed and optimized a full-stack web application for an SEO services marketplace, gaining experience in programming, system integration, and project collaboration

Projects

GNN Autoencoder pretraining on 3D Scene Graphs 2024 – 2025
TODO

Person Tracking 2024 – 2025
TODO

Surface-Aligned Gaussian Splatting for Efficient 3D Mesh Reconstruction and Rendering 2024 – 2025
Seminar project in *Recent Advances in Geometry Processing* (grade: 1.3/1.0) [report] [slides]

Protein Classification Challenge 2025
Optional course project in *Geometric Deep Learning*. Participated in a Kaggle competition on Protein Classification using GNNs. [link]

The Impact of Fiber Orientation Features for Direct White Matter Tract Segmentation 2023 – 2024
Lab project in *Visualization and Medical Image Analysis* (grade: 1.0/1.0). [report][slides][code]

Neural Parametric Models for 3D Deformable Shapes 2023
Seminar project in *Visual Computing* (grade: 1.0/1.0). [report] [slides]

Proteomic Analysis of Stress Granules-Associated Proteins 2022
Extracurricular work. Developed a tool for processing, analysis and visualizing multiple datasets of stress granules-associated proteins to explore their role in neurodegenerative diseases. The tool was used by my brother Bilhan Karacora at the Medical Proteome Center, University of Bochum.

Inverse Rendering of Wave Optical BRDFs 2021 – 2022
Bachelor thesis (grade: 1.1/1.0). Developed, implemented and evaluated inverse rendering methods in consideration of wave-optical effects using BRDF slices. [thesis][slides][code]

Trön Racing, Computer Animation Festival 2021
Course project in *Introduction to Computer Graphics and Visualization* (ungraded). Developed an OpenGL-based video game prototype from scratch. [video][code]

Lightweight Multi-Branch Network for Animal Re-Identification 2021
Bachelor lab project (grade: 1.0/1.0). Prepared a dataset of wild animals dataset captured using camera traps and adapted a person re-identification system for the task of animal re-identification. [report][slides][code]

Publications

Competition papers

RoboCup@Home 2024 OPL Winner NimbRo: Anthropomorphic Service Robots using Foundation Models for Perception and Planning, R. Memmesheimer, J. Nogga, B. Pätzold, E. Kruzhkov, S. Bultmann, M. Schreiber, J. Bode, **B. Karacora**, J. Park, A. Savinykh, S. Behnke. In: RoboCup 2024: Robot World Cup XXVII, Lecture Notes in Computer Science (LNCS), vol. 15570, pp. 515–527, Springer, April 2025.

Skills

Programming: Python (very good), C/C++, Matlab (good)
Frameworks: Pytorch (very good), Pytorch Geometric, Tensorflow, CUDA (good), OpenGL (basic)
Developer Tools: Git, VS Code, Docker, Bash, Linux system
Libraries: NumPy, Matplotlib, pandas, open3d
Miscellaneous: LaTeX, ROS 2, ONNX, TensorRT