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

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

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

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

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

Proteomic Analysis of Stress Granules-Associated Proteins 2022
Extracurricular work. Developed a tool for analysis of stress granules as a potential origin of abnormal protein aggregation in neurodegenerative diseases. The tool was used at the Medical Proteome Center, University of Bochum.

Inverse Rendering of Wave Optical BRDFs 2021 – 2022
Bachelor thesis (grade: 1.1/1.0). Implementation and evaluation of inverse rendering methods in consideration of wave-optical effects. [thesis][slides][code]

Trön Racing, Computer Animation Festival 2021
Course project. Developed an OpenGL-based video game prototype from scratch accompanying the lecture *Introduction to Computer Graphics and Visualization.* [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