BERK KIVILCIM

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EDUCATION

Karlsruhe Institute of Technology (KIT) **2022 – 2024**
Department of Civil Engineering, Geo and Environmental Sciences Karlsruhe, Germany

- **Master of Science in Remote Sensing and Geoinformatics, GPA: 1.3** (German Grading Scale – *Very good*)
- **Elective Profile Module:** Computer Vision and Geoinformatics
- **Thesis** [Computer Graphics and Visualization Group (TU Delft), Institute of Photogrammetry and Remote Sensing (KIT), 2024]: *Studying the Geometric Convergence Behaviour of Neural Radiance Fields (NeRFs) for Improving Training Time*
    - Developed an adaptive strategy by utilizing voxels to terminate training when 3D geometric convergence reaches a sufficient level to significantly conserve time and computation resources without compromising the quantitative and qualitative qualities
    - Developed a method that leverage pixel depth information to mask pixels that see converged regions, allowing the model to focus on unconverged regions during training. This approach aims to mitigate the divergence issue that might arise in long-term training.
    - Thesis, codes and implementation details shared on Github
- **Lab Rotation II** [Computer Graphics and Visualization Group (TU Delft), Institute of Photogrammetry and Remote Sensing (KIT), 2023]: *Evaluation of NeRF Methods – Impact of Trajectories and Implications for Real-Time 3D Reconstruction*
- **Lab Rotation I** [Geodetic Institute, 2023]: *CityGML to Voxel Conversion for Geodetic Applications – Designing an Efficient Algorithm to Simulate Time Dilations to Test the Precision of Voxelized Methods*
- **Computer Vision Related Courses:** Computer Vision and Remote Sensing, Advanced Topics in Computer Vision, Active Sensors for Computer Vision, Deep Learning for Computer Vision and Remote Sensing, Seminar Topics of Image Analysis
- **Geoinformatics Related Courses:** Geoinformatics, Geo-Databases, 3D/4D GIS, Mobile GIS and Location Based Services

Stuttgart University of Applied Sciences **2021 – 2022**
Photogrammetry and Geoinformatics Stuttgart, Germany

- Took German language course for daily life and participated in lectures and completed assignments for the 1st semester of the Master's program of Photogrammetry and Geoinformatics before transferring to KIT

Hacettepe University **2016 – 2021**
Geomatics Engineering Department Ankara, Turkey

- **Bachelor of Science in Geomatics Engineering, GPA: 3.01/4.00** (*Honours*)
- **Graduation Project:** Investigation of Forest Fires with Google Earth Engine (as a group of three, 2021)
    - Wrote JavaScript code to visually and numerically analyze satellite images of areas before and after forest fires to quantify and visualize the impact of the forest fire in terms of the size of the burned area and burn severity and compared some supervised, unsupervised and spectral index-based thresholding methods for the analysis and identified the user experiences of these methods from the perspective of a non-expert user
    - Utilized data from Sentinel-2 and Modis satellites through Google Earth Engine (GEE) and the NDVI spectral index for threshold classification and created a user-friendly website that informs users about forest fires and how to investigate them by accessing reliable data through GEE and using our algorithms to analyze their impact
    - Shared the algorithms and the process of using them with GEE on GitHub alongside a tutorial
    - Reached the 2021 finals of TUBITAK 2242 project competition in the environment and energy field
- **Computer Vision Related Courses:** Digital Imaging and Interpretation, Photogrammetry, Digital Image Processing, Signal Processing, Photogrammetric Image Analysis, Fundamentals of Laser Scanning
- **Geoinformatics Related Courses:** Geospatial Data Management, Geographic Information Systems, Spatial Analysis, Programming in Geographic Information Systems, Special Topics in Geomatics Engineering

Research & Work Experience

Karlsruhe Institute of Technology (KIT) **2022 – 2024**
Research Assistant at the Geodetic Institute **Karlsruhe, Germany**

- Worked on the Distributed Simulation of Processes in Buildings and City Models research project, predicting urban heat islands to support urban planners by enhancing the correlation rate between indicator parameters, and insights about trained model evaluations with image comparison metrics.

Karlsruhe Institute of Technology (KIT) **2023 – 2024**
Teaching Assistant: "Numerical Mathematics" (Winter 23/24) **Karlsruhe, Germany**

Akdeniz University **2020 – 2021**
Intern at the Department of Space Sciences and Technologies, under the supervision of Assoc. Prof. Dr. Nusret Demir

- Researched various machine-learning algorithms to analyze forest fires with the help of Google Earth Engine, laying the foundation of my undergraduate graduation project

Geotech Company **2019**
Intern **Ankara, Turkey**

- Generated 3D surface and terrain models of the city of Medina
- Studied the impact of different filtering parameters on the creation of terrain models

Publications

In progress, as First Author ***Upcoming – 2025***

- *Predicting Air Temperature from Volumetric Urban Morphology with Machine Learning*
- The article still under process and a preprint version can be accessible on arXiv

Co-Author: Density-based Geometric Convergence of NeRFs at Training Time **13 Dec 2024**

- Haitz, D., **Kıvılcım, B.**, Ulrich, M., Weinmann, M., and Weinmann, M.: Density-based Geometric Convergence of NeRFs at Training Time: Insights from Spatio-temporal Discretization, *Int. Arch. Photogramm. Remote Sens. Spatial Inf. Sci.*, XLVIII-2/W7-2024, 49–56, https://doi.org/10.5194/isprs-archives-XLVIII-2-W7-2024-49-2024, 2024

Skills & Qualifications

- **Technical**: **Advanced**: Python, Nerfstudio, Matlab, QGIS, PostgreSQL, LaTeX
  Basic: Javascript, Google-Earth-Engine, ArcGIS Pro, Erdas, Lastools
- **Research Interests**: **Main Interests**: Deep Learning and Artificial Intelligence, Neural Radiance Fields, Computer Vision, Geoinformatics, Data Science
  Familiar Topics: Geodesy, Photogrammetry, Surveying, Remote Sensing
- **Language**: Turkish (Native), English (Advanced)
- **Sports**: President of capoeira community at Hacettepe University 2017 – 2019
  Competitor in the Capoeira World Championship, senior category 2018
  Vice-president of capoeira community at Hacettepe University 2016 – 2017

References

- **Prof. Dr. Martin Breunig** martin.breunig@kit.edu Tel: +49 721 608 42302
- **Dr. Patrick Erik Bradley** erik.bradley@kit.edu Tel: +49 721 608 47304

- **Prof. Dr. Mustafa Türker** mturker@hacettepe.edu.tr Tel: +90 312 297 6990
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More Information Available on GitHub