

# Ömer Köse

Portfolio: omer-kose.github.io  
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## EDUCATION

- Middle East Technical University** Ankara, Turkey  
*Bachelor of Science - Computer Engineering, CGPA 3.89/4.00* *September 2018 - July 2023*  
*Taken Master Courses: Digital Geometry Processing, Deep Learning, Scientific Computing*
- Middle East Technical University** Ankara, Turkey  
*Minor Program - Computational Sciences and Engineering, CGPA 3.91/4.00* *September 2018 - July 2023*

## SKILLS SUMMARY

- **Programming:** C, C++, C#, Python, MATLAB, L<sup>A</sup>T<sub>E</sub>X
- **Frameworks:** OpenGL, Eigen, Pytorch
- **Tools:** GIT, Unix/Linux, VIM, Unity
- **Communication:** Turkish, English, German (A2.1)

## EXPERIENCE

- TUBITAK** Ankara, Turkey  
*Research Assistant, Supervised by Professor Yusuf Sahillioglu and Sinan Kalkan* *March 2022 - Present*
  - Currently conducting research on shape correspondence between the shapes which have undergone non-isometric deformations. Being funded under TUBITAK undergraduate researcher scholarship program.
- Max Planck Institute for Informatics** Saarland, Germany  
*Research Assistant, Supervised by Professor Rhaleb Zayer* *June 2021 - January 2022*
  - Worked on mesh flattening under high number of constraints. Extended the framework to map a face texture on a face mesh. A pre-trained neural network is used to extract face features from the face texture
  - Developed a framework in MATLAB which provides a user interface and flattens the mesh. Developed a visualizer in C++ with OpenGL to visualize textures on the meshes using the UV coordinates obtained in MATLAB.
- Middle East Technical University** Ankara, Turkey  
*Research Assistant, Supervised by Professor Yusuf Sahillioglu* *July 2021 - October 2021*
  - Worked on mesh morphing. Explored the effect of different bases on mesh morphing problem. Different linear interpolation techniques like linear, bilinear and trilinear interpolation are used to obtain the morph based on the reduced basis projected vertices of the original two shapes.
  - Developed a framework in C++ to get the morphed mesh. Geometry Central and Eigen libraries are used to obtain needed data structures, operators, and solvers. Visualizing is done using the Polyscope library.
- Middle East Technical University** Ankara, Turkey  
*Research Assistant, Supervised by Professor Yusuf Sahillioglu* *January 2021 - June 2021*
  - Worked on geodesics on triangle meshes. Focused on improving graph-based approach towards approximating geodesics. Constructed different graphs to straighten the geodesics locally on each triangle face. Worked on a post-processing step to straighten the geodesics.
  - Developed a framework in C++ to get the geodesics. Geometry Central library is used to obtain needed data structures and operators. Visualizing is done using the Polyscope library.

## PROJECTS

- **CENG501 Deep Learning Course Term Project:** Implemented SMG: A Shuffling Gradient-Based Method with Momentum paper published at ICML 2021 conference with my teammate. Implemented the paper in Python using PyTorch. The networks were trained on Google Colab. Project implementation and the report can be found [here](#)
- **CENG789 Geometry Processing Course Term Project:** Implemented The Heat Method for Distance Computation published at ACM Transactions on Graphics 2013. Implemented the paper in C++ using Geometry Central and Eigen libraries for their data structures, operators, and solvers, Polyscope for Visualization. Implementation can be found [here](#)
- **Procedural Terrain Generator:** Currently developing an engine in C++ with OpenGL. The engine procedurally generates a terrain of different biomes at different heights. Implementation can be found [here](#)
- **Ray Tracer:** Developed a Ray Tracer in C++ following Peter Shirley's *Ray Tracing in One Weekend* series. Implementation can be found [here](#)
- **Rasterizer:** Developed a Software Rasterizer in C++ following Dmitry Sokolov's *Tiny Renderer* wiki. Implementation can be found [here](#)

## PUBLICATIONS

- **Book Contribution:** I am an active contributor of a book on Signals and Systems currently being written by my two professors Assistant Prof. Emre Akbas and Prof. Fatos Yarman Vural, to be used in the Signals and Systems course. I am fixing syntax errors appearing in the Jupyter Book format and plotting new figures. I am also responsible for proofreading the Fourier Analysis chapters of the book.