CSCI 599 - Final project description

What is this project about? In this project you will show your mastery of the class's topics by implementing a recent geometry processing research paper. You will apply some of the specific skills learned in the class, but most importantly you will apply your skill of reading the description a method and turning it into a usable program - the ultimate test of understanding!

This is not a group project. Every student has to choose and do their own individual project, and may not collaborate with others. No two students can choose the same paper for implementation. Your choice of paper must be confirmed by the instructor - make sure to confirm before you start working.

What is the timeline for this project? You can think about which paper you would like to implement all throughout the semester. *You must have made a choice and obtained instructor permission by the end of the first class of week 13*. The project is not valid, unless the instructor approved your specific plan of action.

Week 13 will be fully dedicated to helping you start the project, and you can work in-class on your project for all the classes of week 13.

You have to present your final project in week 15. The exact schedule of presentations will be announced closer to the date.

What tools should I use for this project? Please write your project in C++ with libigl (+the libraries it comes with) - the same tools we are using in the course throughout the semester. You can use external libraries that are not included in the wider libigl family *only if you obtain instructor permission first*.

You cannot use any existing implementations of your paper, such as the official authors' implementation, or implementations that anybody else but you has done. You also cannot use any AI tools to help you with writing the code (see the class's AI policy for more details).

What are my final deliverables? Your final deliverables are:

- A 10min in-class presentation on week 15 about your project.

- A written report (PDF in the ACM TOG LaTeX template) on your project describing your goals, your struggles with the process, a reproduction of some of the original paper's results, an exploration of the paper's limitations, and a validation of the paper's claims.

- A C++ implementation of the paper that will correctly compile and run on the TA's computer with code to reproduce all the figures from your report. Use the same libigl example coding environment you have used for all exercises throughout the semester.

How will the project be graded? The project will be graded on a scale from 0-100, with the following categories contributing:

- 20% presentation

- 20% written report

- 20% completeness of implementation

- 20% correctness of implementation

- 20% code quality of implementation

Example project topics. Here are a few recent geometry processing papers that would make excellent project topics. During the semester, as the class goes on, the instructor will suggest recent articles that make suitable project topics, and you can ask for any of them to be your final project topic. You can also suggest your own.

- **https://doi.org/10.1111/cgf.13931**

- **https://doi.org/10.1145/3243651**

- **https://doi.org/10.1145/3132705**

- **https://doi.org/10.1111/cgf.14356**

- **https://doi.org/10.48550/arXiv.2206.15236**

- **https://doi.org/10.1145/3549540**

- **https://doi.org/10.1145/3197517.3201337**