Taming Large 3D Models:
Approximate Convex Decomposition Using Simplification

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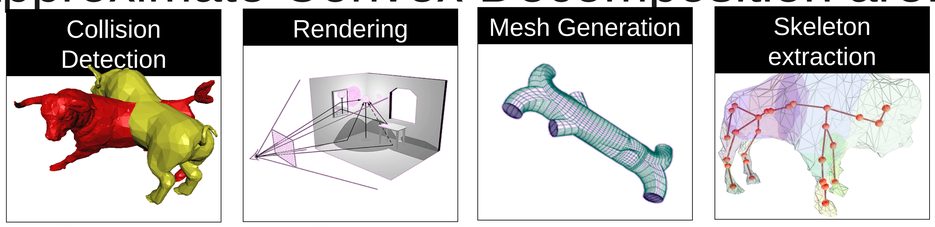
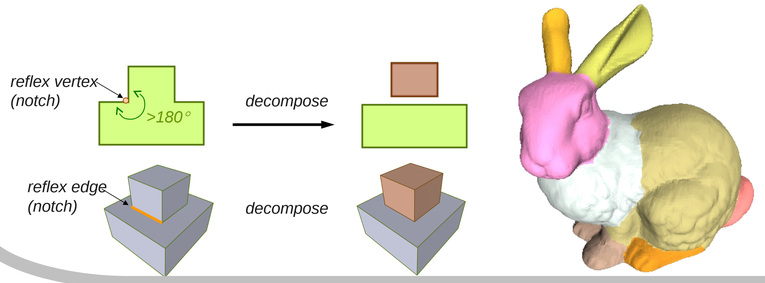
Why do we care? Some applications of Approximate Convex Decomposition are:

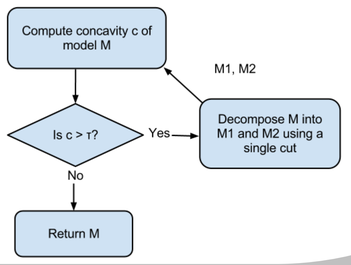


Motive: To **reduce time and expense** of Approximate Convex Decomposition (ACD)

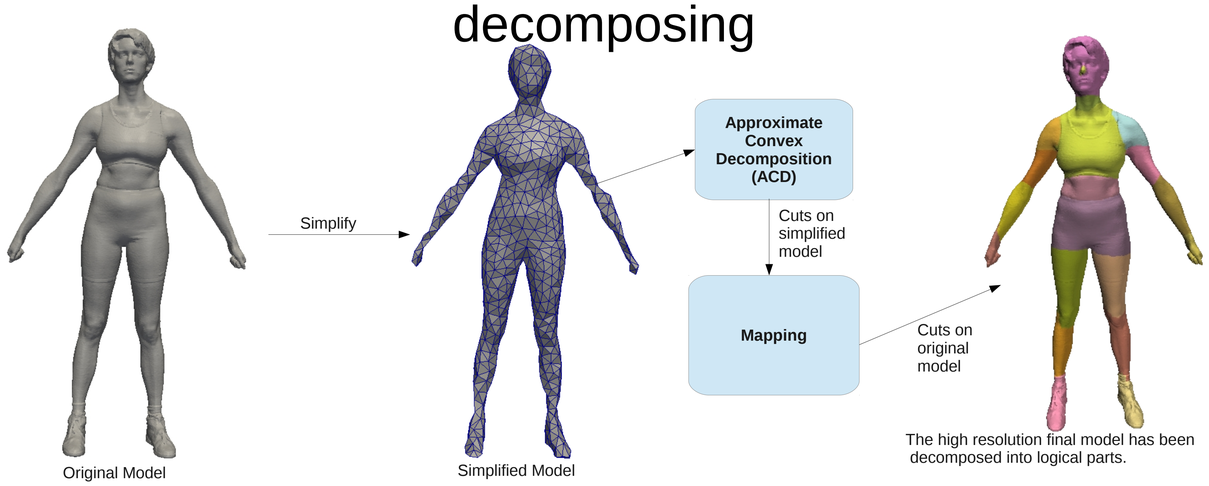
What is Approximate Convex Decomposition (ACD)?

A technique for decomposing a model or polygon into convex sub-models. Many algorithms perform more efficiently on convex objects than non-convex objects.



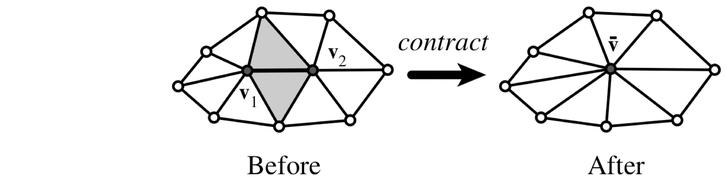


Our Method: to simplify model before decomposing



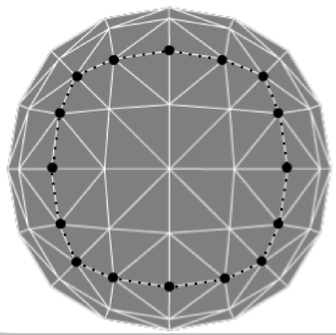
By using this method, surface noise is ignored and overall decomposition time required is decreased

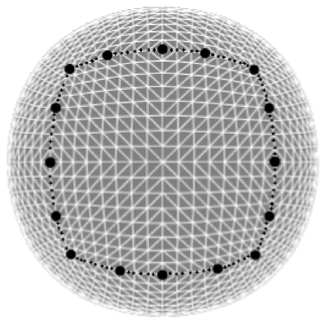
How to simplify a model? By contracting edges that are not important.



Mapping:

After simplification and ACD, we transfer back to the original model using a mapping process.





Using vertices from the simple model, the mapper finds the “in-between” vertices to create a complete path on the original dense model.

Intermediate Results:

The cuts are of poorer quality than without the extra simplification and mapping steps. This could be because Of oversimplification of the model. More work needs to be done to bring up the quality of the cuts. However, The time is greatly increased.

Average time for the female model went from 228.36 seconds to 11.4 seconds.

Future Work: work needs to be done to better integrate the simplification step with the ACD algorithm. Although there has been great improvement in time saved, the quality of the decompositions needs to be improved. Several processes could be written as well to make Automation of ACD simpler.

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