Before

Min Jacobian value = -0.360
Max Jacobian value = 0.998
Avg Jacobian value = 0.829
#Vertices = 42281
#Cells = 40632
#Singularities = 39305

After

#Vertices = 601
#Cells = 392
#Singularities = 80

Run time: 1653 seconds

Smoothed

Min Jacobina value = 0.139
Max Jacobian value = 0.999
Avg Jacobian value = 0.895
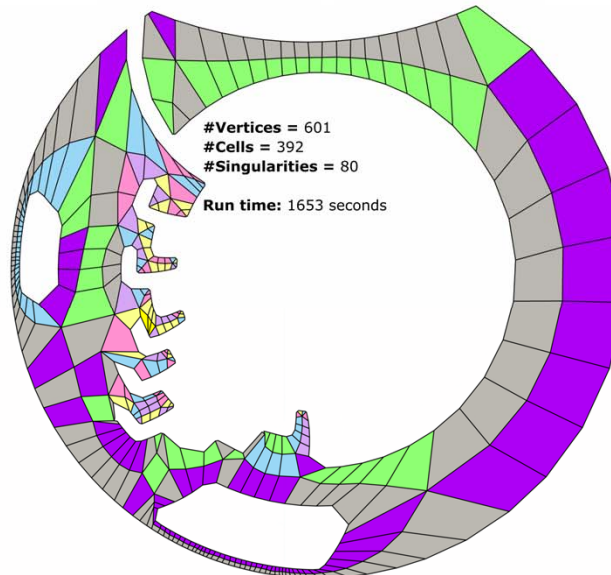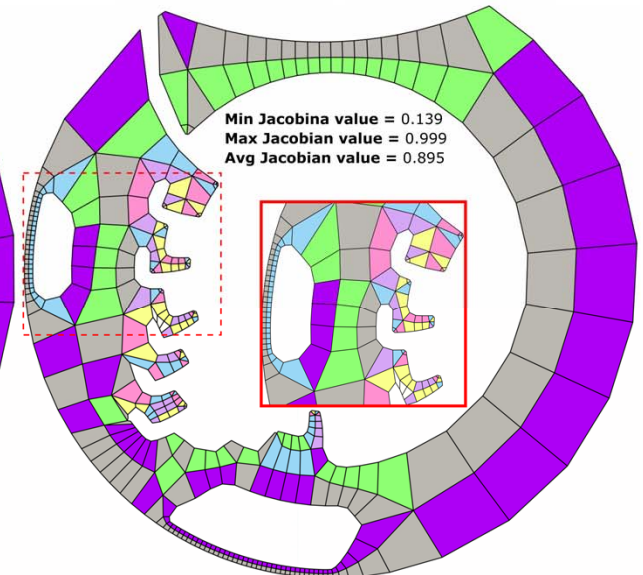
A result of our quad mesh structure simplification framework. Left: input; middle: simplified structure; right: optimized result. Different colored blocks in the right image show different base complex components. The statistics of the meshes before and after simplification are shown by the corresponding numeric values. This result shows that our framework not only can significantly reduce the structure complexity (**99%**), but also preserve boundary features.
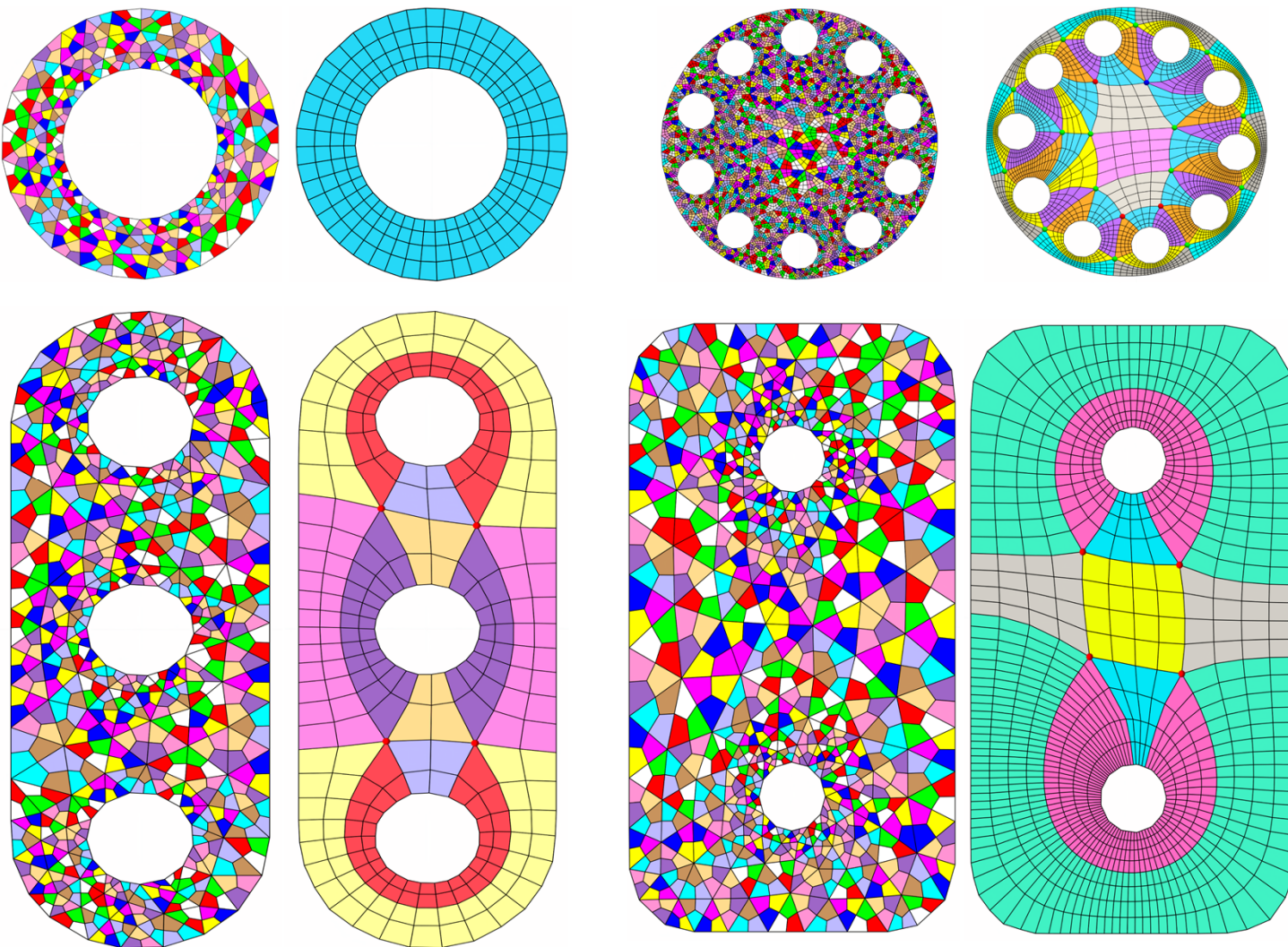
Simplification results of our framework on a number of representative quad meshes. Left image of each pair shows the input mesh while the right image shows the simplification result. Different colored blocks correspond to different base complex components.

Model	Input			Output			R	Time (s)
	#V	#F	#S	#V	#F	#S		
1 hole	470	420	230	69	46	0	**100%**	0.46
2 holes	1093	1029	539	90	61	4	**99.3%**	1.60
3 holes	842	765	417	88	60	4	**99.0%**	1.17
10 holes	8799	8424	1137	288	199	19	**98.3%**	7.46
teaser	42281	40632	39305	601	392	80	**99.8%**	1653.76

Performance for our simplification method when applied to models shown in the previous slides. #V, #F, and #S denote the number of vertices, faces, and singularities, respectively. **R** indicates the reduction ratio of the singularities, computed as (Input #S − Output #S)/Input #S.