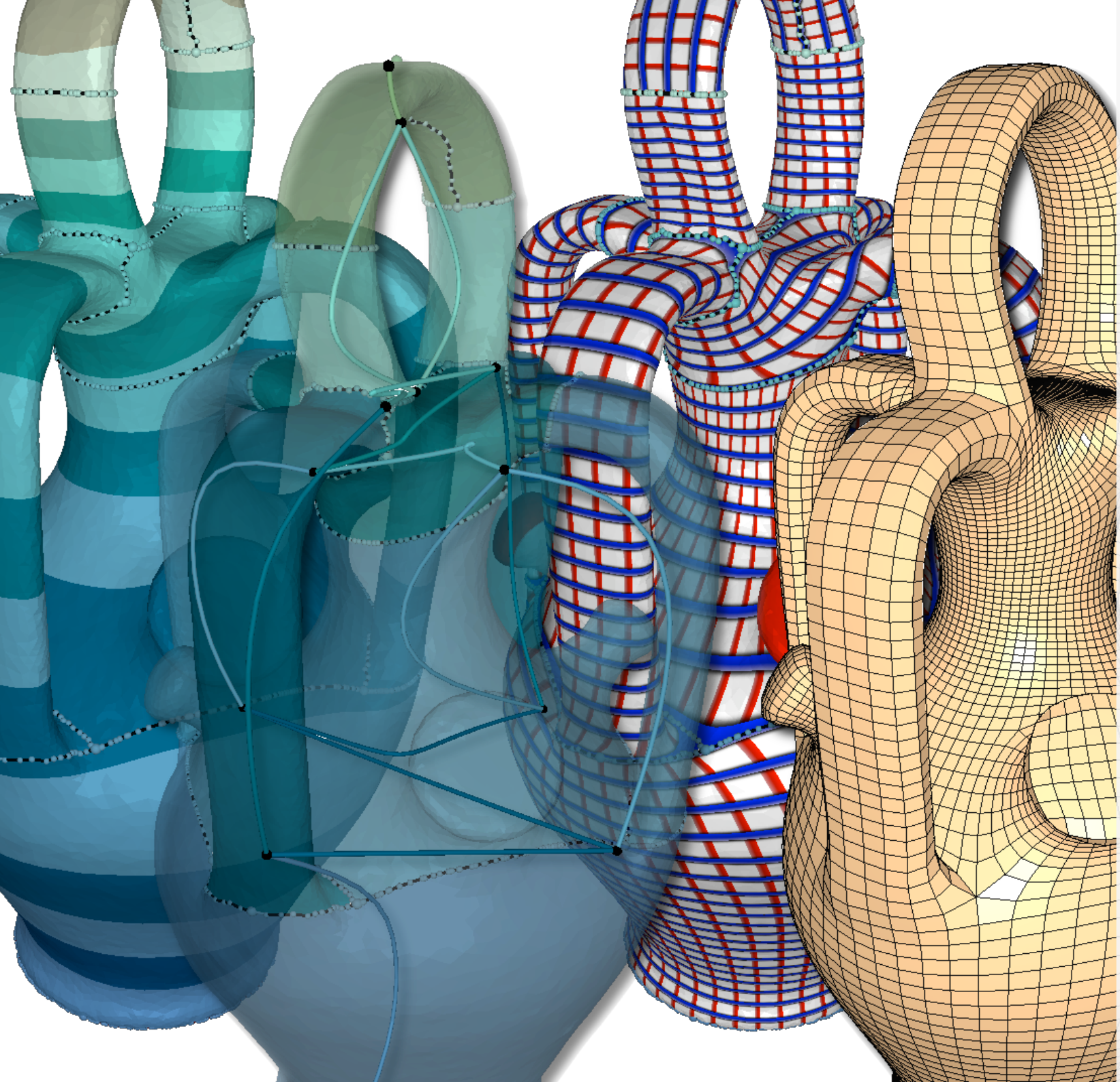

Interactive Quadrangulation with Reeb Atlases and Connectivity Textures

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Creating high-quality quad meshes from triangulated surfaces is a highly non trivial task that necessitates consideration of various application specific metrics of quality. In our work, we follow the premise that automatic reconstruction techniques may not generate outputs meeting all the subjective quality expectations of the user. Instead, we put the user at the center of the process by providing a flexible, interactive approach to quadrangulation design. By combining scalar field topology and combinatorial connectivity techniques, we present a new framework, following a coarse to fine design philosophy, which allows for explicit control of the subjective quality criteria on the output quad mesh, at interactive rates.

Our quadrangulation framework uses the new notion of Reeb atlas editing, to define with a small amount of interactions a coarse quadrangulation of the model, capturing the main features of the shape, with user prescribed extraordinary vertices and alignment. Fine grain tuning is easily achieved with the notion of connectivity texturing, which allows for additional extraordinary vertices specification and explicit feature alignment, to capture the high-frequency geometries.

Experiments demonstrate the interactivity and flexibility of our approach, as well as its ability to generate quad meshes of arbitrary resolution with high quality statistics, while meeting the user's own subjective requirements.

Paper

Video

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