

Geometry Processing with Intrinsic Triangulations

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The intrinsic viewpoint was a hallmark of 19th century geometry, enabling one to reason about shapes without needing to consider an embedding in space—and leading to major developments in the 20th century such as Einstein’s theory of general relativity. Yet 21st century digital geometry processing still largely adopts an extrinsic mindset, where the geometry of a polyhedral surface is expressed via vertex positions in n -dimensional space. This talk explores how the intrinsic view of polyhedral surfaces helps relax some standard assumptions in geometric computing, leading to algorithms that are often more flexible and numerically more robust. In particular we will examine fundamental data structures for intrinsic triangulations, extensions of important triangulation algorithms to curved surfaces,