GPU Collision Detection in Conformal Geometric Space

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We derive a conformal algebra treatment unifying all types of collisions among points, vectors, areas (defined by bivectors and trivectors) and 3D solid objects (defined by trivectors and quadvectors), based in a reformulation of collision queries from $\mathbb{R}^3$ to conformal $\mathbb{R}^{4,1}$ space. The algebraic formulation in this 5D space is then implemented in GPU to allow faster parallel computation queries. Results show expected orders of magnitude improvements computing collisions among known mesh models, allowing interactive rates without using optimizations and bounding volume hierarchies.

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