Quaternions, Dual Quaternions and Clifford algebras

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Abstract

After a brief review of Hamilton's quaternions and how they can be used to represent rotations, Clifford's dual quaternions will be discussed.

The use of this algebra to represent rigid-body displacements will be explained. As will the relation to the Study quadric. The representation of twists, infinitesimal rigid-body displacements, will also be considered.

Finally, the notion of Clifford algebras will be introduced and various examples will be considered. In particular, examples representing the algebra of 3-dimensional Euclidean geometry will be outlined.