

Dual quaternions and the study quadric

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Resumo: This talk begins by looking at the familiar topic of quaternions and how they are used to represent rotations in space. This is then extended to dual quaternions and how they can be used in an analogous way to represent rigid-body displacements in 3D. This leads naturally to the specification of the Study quadric as a model for the group manifold of the group $SE(3)$ of rigid-body displacements (proper isometries of R^3). In the remainder of the talk some linear and quadratic subspaces of the Study quadric will be discussed along with their geometric significance and use in Robot kinematics.