Project title: Dual Quaternions for pose estimation and motion tracking

Abstract: Dual number quaternions can elegantly capture translation and rotation in a unified formalism that has a number of advantages over other methods (e.g. Euler angle-based homogeneous coordinates) and is extensively used in robotics, computer graphics, etc. In this project, we will apply the dual quaternion formalism to motion tracking using mixed input devices, e.g. visual sensors and accelerometers. This will involve implementing and testing existing dual quaternion-based pose estimation and Kalman filter routines as well as developing multi-sensory integration algorithms. Performance will be compared to classical approaches using real measurement data.