

Unmanned Aerial Vehicles

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November 27, 2017

Unmanned Aerial Vehicles (UAVs) have been increasing in popularity over the last years, every day, more people are interested on developing new applications for these robotic systems, some of them, demanding more complex capabilities, which represent a challenge for the designers of this kind of vehicles. Most researchers have relied on the classical Euler angles to represent the dynamics of UAVs, this approach is intuitive and easy to implement, specially when the design and application are simplified, e.g. maintaining small angles, slow movements, or not including mechanically complex components. Quaternions provide an interesting alternative for representing the rotation of rigid bodies such as aerial vehicles, they have great advantages compared to Euler angles, i.e. they lack of discontinuities, gimbal lock and provide mathematical simplicity, these properties make it possible to describe UAVs in a simpler manner without losing generality, which is useful when more difficult tasks are needed such as aggressive maneuvers, complex path tracking, or disturbance rejection.