Coupling architecture between INS/GPS for precise navigation on set paths

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Abstract

GPS offers the advantage of providing high long-term position accuracy with residual errors that
affect the final positioning solution to a few meters with a sampling frequency of 1 Hz (Marston
et al. in Decis Support Syst 51:176–189, 2011 [1]). The signals are also subject to obstruction and
interference, so GPS receivers cannot be relied upon for a continuous navigation solution. On
the contrary, the inertial navigation system has a sampling frequency of at least 50 Hz and
exhibits low noise in the short term. In this research, a prototype based on development cards is
implemented for the coupling of the inertial navigation system with GPS to improve the
precision of navigation on a trajectory.