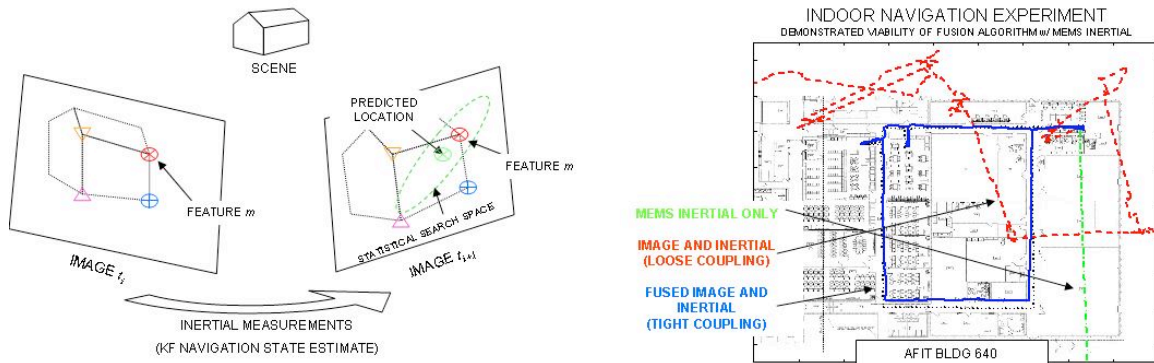


Fusion of Optical and Inertial Sensors for Navigation

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Sponsor: Air Force Research Laboratory (AFRL)



This research focuses on fusing optical and inertial sensors for robust, self-contained, passive, autonomous navigation. This effort is motivated by the requirement for autonomous navigation in environments where external navigation reference sources (such as the Global Positioning System) are unavailable. The overall objective of this research is to exploit the natural synergy between imaging and inertial sensors through deep integration techniques; that is, combining image and inertial sensor data at a more fundamental level in order to exploit mutual synergy between the two devices. At the heart of this approach is a rigorous method to combine previous image information with inertial navigation system measurements to predict feature locations in new images. Using this approach yields a robust, efficient algorithm that can be applied in real-time. An experimental test setup has demonstrated the ability of this system to navigate in an aircraft and indoors with no a priori knowledge of the environment.

For more information see “Veth, M. and J. Raquet, “Fusion of Low-Cost Imaging and Inertial Sensors for Navigation,” *Proceedings of ION GNSS-2006*, Fort Worth, TX, Sep 2006”.

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