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Visual-inertial navigation systems are credited with superiority over both pure visual approaches and filtering ones. In

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spite of the high precision many state-of-the-art schemes have attained, yaw remains unobservable in those systems all the same.

VIMO: A Visual-Inertial-Magnetic Navigation System Based ...

As cameras and IMUs are becoming ubiquitous, visual-inertial navigation

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systems (VINS) that provide high-precision 3D motion estimation, hold great potentials in a wide range of applications from augmented reality (AR) and aerial navigation to autonomous driving, in part because of the complementary sensing capabilities and the decreasing costs and size of these sensors.

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Visual-Inertial Navigation: Challenges and Applications

Abstract: In this paper, we present a hybrid visual inertial navigation algorithm for an autonomous and intelligent vehicle that combines the multi-state constraint Kalman filter (MSCKF) with the nonlinear visual-

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inertial graph optimization. The MSCKF is a well-known visual inertial odometry (VIO) method that performs the fusion between an inertial measurement unit (IMU) and the image measurements within a sliding window.

EKF-Based Visual Inertial Navigation Using Sliding Window ...

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Abstract: As inertial and visual sensors are becoming ubiquitous, visual-inertial navigation systems (VINS) have prevailed in a wide range of applications from mobile augmented reality to aerial navigation to autonomous driving, in part because of the complementary sensing capabilities and the decreasing costs and size of the sensors. In this

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paper, we survey thoroughly the research efforts taken in this field and strive to provide a concise but complete review of the related work -- which ...

[1906.02650] Visual-Inertial Navigation: A Concise Review

Abstract As inertial and visual sensors are becoming ubiquitous, visual-inertial

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navigation systems (VINS) have prevailed in a wide range of applications from mobile augmented reality to aerial...

Visual-Inertial Navigation: A Concise Review

Visual-inertial integrated navigation system (VINS) has been extensively

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studied over the past decades to provide accurate and low-cost positioning solutions for autonomous systems. Satisfactory performance can be obtained in an ideal scenario with sufficient and static environment features.

Robust Visual-Inertial Integrated

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As we described in this post, some researches have addressed the integration of deep learning and inertial navigation with promise results.

References. Huang, Guoquan. "Visual-inertial navigation: A concise review." 2019 International Conference on Robotics and Automation (ICRA). IEEE,

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2019. Cortés, Santiago, Arno Solin, and Juho Kannala.

Deep Learning for Inertial Navigation | by Barak Or | Aug ...

Visual-Inertial Navigation, Mapping and
Localization: A Scalable Real-
Time Causal Approach Eagle S. Jones
Stefano Soatto Submitted to the Intl. J. of

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Robotics Research, August 27, 2009
Revised May 10, 2010; Accepted
September 23, 2010 Abstract We
present a model to estimate motion
from monocular visual and inertial
measurements. We analyze

Visual-Inertial Navigation, Mapping and Localization ...

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Visual-inertial navigation has recently prevailed in robot localization in 3D (e.g., [2-8,12-16,19-26]), which can be broadly categorized into loosely-coupled and tightly-coupled approaches. The former processes the IMU measurements and/or images separately in a front end, and subsequently fuses them in a back end (e.g., [8, 23]).

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Towards Consistent Visual-Inertial Navigation

Visual-inertial navigation that is able to provide accurate 3D localization in GPS-denied environments has seen popularity in recent years due to the proliferation of cost-effective cameras and...

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High-Accuracy Preintegration for Visual-Inertial Navigation

S. Heo, J. Cha, and C. G. Park, "EKF-based visual inertial navigation using sliding window nonlinear optimization," IEEE Transactions on Intelligent Transportation Systems, vol. 20, no. 7, pp. 2470-2479, 2019.

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CKF-Based Visual Inertial Odometry for Long-Term ...

Abstract—We study a Visual-Inertial Navigation (VIN) problem in which a robot needs to estimate its state using an on-board camera and an inertial sensor, without any prior knowledge of the external environment. We consider

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the case in which the robot can allocate limited resources to VIN, due to tight computational constraints.

Attention and Anticipation in Fast Visual-Inertial Navigation

Visual odometry is the process of determining equivalent odometry information using sequential camera

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images to estimate the distance traveled. Visual odometry allows for enhanced navigational accuracy in robots or vehicles using any type of locomotion on any surface.

Visual odometry - Wikipedia

One canonical way of fusing IMU measurements in aided inertial

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navigation is to use an extended Kalman filter (EKF) (see, e.g., Mourikis and Roumeliotis, 2007). In this method, the inertial measurements are used to predict to the next time instance, whereas measurements from exteroceptive sensors are used to update the state estimate.

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Closed-form preintegration methods for graph-based visual ...

employed for real-time visual-inertial localization in conjunction with the EKF-based estimator of (Li and Mourikis, 2012a). This is a hybrid estimator, which combines a sliding-window formulation of the filter equations with a feature-based one, to exploit the computational

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advantages of both.

Vision-aided Inertial Navigation with Rolling-Shutter Cameras

A Linear-Complexity EKF for Visual-
Inertial Navigation with Loop Closures
Patrick Geneva, Kevin Ekenhoffy, and
Guoquan Huangy Abstract □Enabling
real-time visual-inertial navigation in

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unknown environments while achieving bounded-error performance holds great potentials in robotic applications.

A Linear-Complexity EKF for Visual-Inertial Navigation ...

This paper presents a visual-inertial odometry framework that tightly fuses inertial measurements with visual data

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from one or more cameras, by means of an iterated extended Kalman filter. By emplo...

Iterated extended Kalman filter based visual-inertial ...

Here we provide a complete system for visual-inertial navigation using synthetically generated vision and

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inertial measurements. This code was used for the comparison against the current state-of-the-art discrete method in GTSAM by Forster et al.. All preintegration methods are implemented in the GTSAM optimization framework.

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