GSAIM Seminar

(The four minute a Day Seminar Series)

"Real-time Camera Tracking using Combined Non-linear Filters"

by

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Abstract

Real-time camera tracking is steadily gaining in importance due to the drive from various applications, such as AR(augmented reality), natural user interface, and mobile computing environment. However, tracking a monocular camera at real-time in an unknown environment is not a trivial work. In this paper, we describe a real-time camera tracking framework specifically designed to track a monocular camera in a desktop workspace. In particular, we focus on integration of a bunch of non-linear filters to achieve robust camera tracking and scalable feature mapping which can extend to larger environment. Basic idea of the proposed framework is that a particle filter-based camera tracking is connected to independent feature tracking filters which have fixed state dimensions. In the proposed framework, every estimate required for template prediction is obtained from the independent feature trackers so that the template prediction can be maintained without additional framework for the template state estimation. In addition, we split the camera tracking and feature mapping into two separate tasks, and they are handled in two parallel processes. We demonstrate the effectiveness of the proposed approach within a desktop environment in real-time.