Hierarchical Multi-Parametric and Multi-Resolution (HMPMR) Visual Tracking
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Keywords

Computer Vision, Visual Tracking, UAVs, Direct Methods

The basis of this research is the analysis and pursuit of new visual tracking strategies capable of overcoming problems found when tracking objects from images taken from Unmanned Aerial Vehicles (UAVs).

Tracking on-board UAVs requires robust and real-time motion estimations in order to develop vision-based control tasks (e.g. landing).

In this work, we propose the use of hierarchical structures (in terms of image resolution and number of parameters estimated in each resolution) and image registration techniques, based on direct methods, for tracking tasks on-board UAVs that can overcome problems posed by the challenging conditions of the tasks: e.g. constant vibrations, fast 3D changes, or limited capacity on-board.

The strategy has been successfully applied for tracking objects on-board UAVs, and for solving the drogue-tracking problem in Autonomous Air-to-Air Refuelling (AAAR) tasks for the drogue and probe method.

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