EFFICIENT VIDEO MOSAICKING BY MULTIPLE LOOP CLOSING

J. Meidow

Fraunhofer Institute of Optronics, System Technologies and Image Exploitation, 76275 Ettlingen, Germany – jochen.meidow@iosb.fraunhofer.de

Working Groups I/2, III/1, III/4, III/5

KEYWORDS: image alignment, mosaic, loop closing, homography, exponential representation, parameter estimation

ABSTRACT:

The rapid generation of aerial mosaics is an important task for change detection, e.g. in the context of disaster management or surveillance. Unmanned aerial vehicles equipped with a single camera offer the possibility to solve this task with moderate efforts. Unfortunately, the accumulation of tracking errors leads to a drift in the alignment of images which has to be compensated by loop closing for instance. We propose a novel approach for constructing large, consistent and undistorted mosaics by aligning video images of planar scenes. The approach allows the simultaneous closing of multiple loops possibly resulting from the camera path in a batch process. The choice of the adjustment model leads to statistical rigorous solutions while the used minimal representations for the involved homographies and the exploitation of the natural image order enable very efficient computations. The approach will be empirically evaluated with the help of synthetic data and its feasibility will be demonstrated with real data sets.

This contribution was selected in a double blind review process to be published within the ***Lecture Notes in Computer Science*** series (Springer-Verlag, Heidelberg).

Photogrammetric Image Analysis

Volume Editors:	Stilla U, Rottensteiner F, Mayer H, Jutzi B, Butenuth M
LNCS Volume:	6952
Series Editors:	Hutchison D, Kanade T, Kittler J, Kleinberg JM, Kobsa A, Mattern F, Mitchell JC, Naor M, Nierstrasz O, Pandu Rangan C, Steffen B, Sudan M, Terzopoulos D, Tygar D, Weikum G
ISSN:	0302-9743

The article is accessible online through www.springerlink.com.