ISPRS Working Group III/5 – Image Sequence Analysis

Annual Report 2010

1. State of Science and Technology of Working Group Topics

Goals:
Image sequence analysis is playing an important role in many fields of close-range photogrammetry, computer vision, machine vision and robot vision for many years. With the development of modern, flexible digital sensors, automatic methods for analyzing and evaluating image sequences are also entering the fields of aerial photogrammetry and remote sensing. Examples of the application of image sequence analysis in photogrammetry and remote sensing are 2D/3D object tracking, ego-motion determination, detection and characterization of dynamic processes, deformation measurements, monocular or stereoscopic mapping of the environment of a UAV or an autonomous robot, mobile mapping, biomedical motion analysis, and many others.

However, recent research has shown that a pure transition of methods mainly designed for the analysis of (close-range) video streams to the aforementioned applications is not possible due to different camera characteristics, varying frame rates, other platforms and, in general, very challenging environments. Further theoretical and experimental developments accompanied by thorough validations are thus necessary to better exploit the huge information content of image sequences.

Terms of Reference:
- Studying camera and camera network calibration from image sequences including cameras with non-standard geometry and variable framerate
- Studying ego-motion determination for navigation, georeferencing and object reconstruction
- Studying detection, reconstruction, classification and tracking of single and multiple objects in image sequences
- Studying event reconstruction from image sequences as well as single and multiple video streams
- Investigating the quality assessment of calibration, orientation and object detection using image sequences
- Benchmarking of calibration, orientation and object detection techniques using image sequences

2. Accomplishments of Working Group during the current year

Workshop Eurocow, 10.-12. February 2010, Barcelona, Spain
http://www.ideg.es/page.php?id=787
Co-organization

Commission III Symposium "PCVIA", 01.-03. September 2010, Paris, France
http://pcv2010.ign.fr/
Reviews and co-organizing

Workshop "Multidimensional Geoinformation", 14.-15. Oct. 2010, Karlsruhe, Germany
www.multigi.kit.edu
Co-Organization, invited sessions, youth forum

Performed tests, distributed datasets
We provide datasets on our homepage to perform tests. The datasets will contain image sequences, reference data and additional meta data. Current data sets are:

- http://vision.middlebury.edu/flow/
  We highly encourage you to use this database if you are planning to test your optical flow algorithms
- http://www.mi.auckland.ac.nz/index.php?option=com_content&view=article&id=44&Itemid=67
  This web site of the .enpeda.. (Environmental Perception and Driver Assistance) project offers sets of geometrically rectified stereo image sequences for the purpose of comparative performance evaluation of stereo vision, optic flow, motion analysis, or further techniques in computer vision

3. Working Group News

Planned activities
- 2011, 11.-13. April
  Co-organize the conference "Joint Urban Remote Sensing Event (JURSE 2011)", Munich, Germany
  http://www.pf.bv.tum.de/jurse2011/

- 2011, 11.-13. April
  Co-organize the conference "Earth Observation of Global Changes (EOGC 2011)", Munich, Germany
  http://www.pf.bv.tum.de/eogc2011/

- 2011, 05.-07. October
  Organize the conference "Photogrammetric Image Analysis (PIA11)", Munich, Germany, in conjunction with other working groups of Commission III, follow up of the PIA07 conference in 2007
  http://www.pia11.bv.tum.de/

- 2012, 25 August – 1 September
  Organize sessions at the ISPRS congress in Melbourne, Australia
  http://www.isprs2012-melbourne.org/

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