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Editorial

Special issue on omnidirectional vision, camera networks and non-conventional cameras

The research on omnidirectional vision aims to overcome the visibility restrictions of classical cameras, and explore the benefits of wide-field-of-view imagery and broad visual coverage of environments. It is a multi-disciplinar field that comprises the design of new vision sensors with enhanced field-of-view, the integration of multiple cameras into clusters and networks, and the development of methods and algorithms for processing the acquired image data.

Since its starting days, omnidirectional vision has experienced a stable scientific advancement leading both to significant progress in the theoretical knowledge, and to its exploitation within various application domains that benefit from wide field-of-view imagery. These benefits include increased robustness in camera parameter estimation, increased accuracy when estimating global features such as vanishing points and epipolar geometry, reduced ambiguity between rotation and translation in egomotion estimation, lighting acquisition, and, of course, the large field of view in its own right, with obvious benefits for several application domains like video surveillance.

This special issue is a follow up to the 7th Workshop on Omnidirectional Vision, Camera Networks and Non-classical Cameras, held on October, 2007 in conjunction with the 11th International Conference on Computer Vision in Rio de Janeiro, Brazil. After the event we announced a call for papers, open to the entire community, inviting the submission of original work to be subjected to the ordinary review process of CVIU. The participation exceeded our best expectation, which proves the interest of the topic and the vitality of the research activity. We received a total of 36 articles from which 10 were selected to feature this special issue. These papers span a rather representative range of topics of omnidirectional vision, including sensor design, camera hand off in hybrid networks, general methods for camera calibration, multiple view geometry in images with radial distortion, egomotion estimation using wide field-of-view images, and visual localization in robotics.

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