

Registration of static images and image sequences by computational methods

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Image registration, i.e., the process of transforming an image so that the structures represented are properly adjusted to the homologous structures represented in a second image, has been a topic of huge research in Computational Vision. Such transformation has been frequently applied on static images, but also on image sequences. For example, in Medicine, computational methods of image registration have a crucial role in supporting efficient image-based diagnosis, by fusion the information conveyed in images acquired by different image modalities, at distinct time instants or from several viewpoints. Hence, the computational registration of images has been a remarkable tool for clinicians and researchers since complex image based tasks, such as the comparison of a given clinical case with previously studied ones, the automatic identification of regions of interest in images (i.e. image segmentation) and information fusion, are facilitated and can be achieved automatically and without subjectivity.

Usually, associated to the topic of image registration issues regarding image matching, i.e. the searching for correspondences between two related images, and image interpolation, specially due to the application of the transformation found to one image in the discrete domain, are found.

During this presentation, the topic of image registration is going to be introduced, automatic computational methodologies to matching and registering static images and image sequences that we have been developing are going to be described, and application cases involving static images, image sequences and images acquired by different imaging modalities are going to be presented and discussed.

Biography

Joao Manuel R.S. Tavares is graduated in Mechanical Engineering from University of Porto, Portugal (1992). In 1995, he obtained a M.Sc. in Electronic and Computer Engineering also at University of Porto. In 2001, he obtained a Ph.D. degree in Electrical and Computer Engineering from the same University. He is senior researcher and project coordinator at Institute of Mechanical Engineering and Industrial Management and Associate Professor in the Department of Mechanical Engineering of the Faculty of Engineering of the University of Porto. His main research areas include computational vision, computational mechanics, scientific visualization, human-computer interaction and new product development.

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