World Academy of Science, Engineering and Technology
International Journal of Computer and Information Engineering
Vol:12, No:02, 2018

Robust Image Registration Based on an Adaptive Normalized Mutual Information Metric

Authors : Huda Algharib, Amal Algharib, Hanan Algharib, Ali Mohammad Alqudah

Abstract : Image registration is an important topic for many imaging systems and computer vision applications. The standard image registration techniques such as Mutual information/ Normalized mutual information -based methods have a limited performance because they do not consider the spatial information or the relationships between the neighbouring pixels or voxels. In addition, the amount of image noise may significantly affect the registration accuracy. Therefore, this paper proposes an efficient method that explicitly considers the relationships between the adjacent pixels, where the gradient information of the reference and scene images is extracted first, and then the cosine similarity of the extracted gradient information is computed and used to improve the accuracy of the standard normalized mutual information measure. Our experimental results on different data types (i.e. CT, MRI and thermal images) show that the proposed method outperforms a number of image registration techniques in terms of the accuracy.

Keywords : image registration, mutual information, image gradients, image transformations
Conference Title : ICCVIP 2018 : International Conference on Computer Vision and Image Processing
Conference Location : Dublin, Ireland
Conference Dates : February 15-16, 2018