(1)

Distributed patching for mobile wireless sensor networks

Samia A. Ali , Khaled M. Shaaban,Islam M. Alkabbany

Abstract:

Mobilewirelesssensornetworks(MWSNs),thecontinuousmovementofsensornodes,maycause completedisconnectionofthenetworkoratbestapartofit.Thedesignofsuchnetworksshould guaranteethatallsensornodesatalltimeshaveapathtothesinknode(s).Prolongingthelifetimesof the MWSNsisacrucialdesignissuebutshouldnotbeattheexpenseofotheressentialfunctionssuch as connectivity.Inthispaper,weproposeanenergyefficientdistributedframeworkforconnectivity maintenanceofMWSNs.Intheproposedframework,sensornodesoftheMWSNsscheduleandcontrol their radiofrequency(RF)modulesbasedondynamiccoordinatedreconstructionmechanism,some senornodesmaylosetheirconnectivitywiththenetworkduetomobility,depletionofenergyand/or incurredfaults.Twoprotocolsaredevelopedtopatchupthedisconnectionoftheirnetworks.Thefirst protocolreestablishesthenetworkconnectionconsumingfarlessenergythanstate-of-the-art alternatives.However,itiscapableofreestablishingtheconnectionwhennomorethan20%ofthe MWSN backbonenodesloseconnectionconcurrently.Thesecondprotocolextendsthislimittooperate when upto35%oftheMWSNbackbonenodesloseconnectionsimultaneously.

Keywords:

Mobile wirelesssensornetworks Patching upnetworkbackbone Energy efficient Connectivity Minimum connecteddominatingset

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(2)

Region-based Deformable Net for automatic color image segmentation

Khaled M. Shaaban*, Nagwa M. Omar

Abstract:

Abstract. This paper introduces a new color image segmentation framework that unifies contour deformation and region-based segmentation. Instead of deforming a single or multiple contours, typically used with classical deformable contour methods, the proposed framework deforms a single planar net that represents the contours of all the objects in the image. The net consists of a group of vertices connected by edges without crossing each other. The connected edges form polygons that represent the segmented regions boundaries. During the deformation process, the algorithm changes the location and the number of vertices as well as the number of polygons to enhance the segmentation fit. The deformation forces for each polygon are generated based upon the average color of the region and the color of the pixels surrounding it. The algorithm is completely autonomous and does not require any user interference, training or preknowledge about the image contents. The experimental results demonstrate the capability of the algorithm to segment color images from arbitrary sources within reasonable time. Furthermore, the compact mathematical representation of the resulting boundaries could be of value for further image analysis.

Keywords:

Deformable contours

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(3)

Planning Form-Closure Grasps of 2D Objects for Robotic Hands

Khaled M. Shaaban and Hesham A. Mohamed

Abstract:

Grasp planning is the problem of finding the contact locations and the forces to apply by the fingers on the object surface to grasp it. This work proposes a new technique that solves a simplified version, (2-D), of this planning problem. This technique is used for planning form-closure grasps. In this type of grasp, the fingers surround the object and hold it securely against the palm. It could be used successfully to restrain the object with minimum concern about the applied forces even when the coefficient of friction is small. Instead of using shape primitives or hand preshapes to simplify the problem solution, this work suggests an optimization technique. This technique searches for the maximum value of a Grasp Quality Metric ( ) which corresponds to the best form-closure grasp. To find this value, the proposed technique requires the development of two algorithms. The first one generates a grasp for a given object at a specific approach angle of the robotic hand, and it is called the Grasp Generator. The second one is called the Search Algorithm. This algorithm explores all approach angles for the best grasp. The outputs of this algorithm are the position and the orientation of the palm and the joint angles of the fingers at the best grasp. The proposed method is used for a two-fingered robotic hand with eight degrees of freedom, and it is implemented and tested on a wide variety of 2D objects. The results show the effectiveness of the method to achieve the planning of form-closure grasps of any 2D object.

Keywords:

Keywords: Anthropomorphic Robotic Hand, Enveloping Grasp, Form-Closure Grasp, Grasp Planning, and Grasp Quality Metric.

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(4)

Planning Enveloping Grasps of 2D Objects for Anthropomorphic Hands

Khaled M. Shaaban and Hesham A. M. Haridi

Abstract:

This work proposes a new technique to plan enveloping grasps of 2D objects. The method is guided by the idea that the best grasp is the grasp that has a complete and proper contact between the hand and the object. This technique searches for the maximum value of a Grasp Quality Metric (Q) which corresponds to the best enveloping grasp. To find this value, the proposed technique requires the development of two algorithms. The first one generates a grasp for a given object at a specific approach angle, and it is called the Grasp Generator. The second one is called the Search Algorithm. This algorithm explores all approach angles for the best grasp. The proposed method is used for a two-fingered robotic hand with eight degrees of freedom, and it is implemented and tested on a wide variety of 2D objects to show its effectiveness.

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(5)

Depth extraction of partially occluded objects using deformable net

Khaled M. Shaaban,Nagwa M. Omar

Abstract:

NULL

Keywords:

NULL

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