Detection and characterization of junctions in a 2D image

R. Bergevin and A. Bubel

Computer Vision and Systems Laboratory, Department of Electrical and Computer Engineering, Laval University, Que., Canada G1K 7P4

Received 24 May 2001; accepted 14 October 2003;
Available online (Science Direct) 3 December 2003.

Abstract

A new junction characterization and validation method is proposed. Junction branches of volumetric objects are extracted at interest points in a 2D image, using a topologically constrained grouping process. This is followed by structural validation and position refinement of extracted junctions. An interesting feature of the proposed method is that all types of junctions are described uniformly and extracted using the same generic process. For instance, the size of the interest regions is kept constant despite local variations in contour density and curvature. Validation rate of real junctions is high and most false hypotheses are properly rejected. An experimental evaluation illustrates the capabilities of the proposed method in demanding situations.

Author Keywords: Junction detection; Branch characterization; Interest points; Vector quantization; Topological criteria; Edge grouping.