World Scientific
www.worldscientific.com

Contour-Point Signature Shape Descriptor for Point Correspondence

Alejandro J. Giangreco-Maidana

Engineering School
National University of Asuncion, Paraguay
ajgiangreco@gmail.com

Horacio Legal-Ayala* and Christian E. Schaerer†

Polytechnic School
National University of Asuncion
P.O. Box 2111 SL. Central, Paraguay
*hlegal@pol.una.py
†cschaer@pol.una.py

Waldemar Villamayor-Venialbo

Centro Paraguayo de Informaciones Astronómicas
Asuncion, Paraguay
wvenialbo@gmail.com

This paper introduces a novel descriptor technique denoted as Contour-Point Signature (CPS) useful to find correspondences of points selected from the outer contours of two arbitrary shapes, and to establish a relationship to map an ordered sequence of contour points from one shape to another. The proposal has proved to be invariant, to translation, scaling and rotation, it also induces a measure which is proved to be non-negative, unique, symmetric and identity-preserving. Experimental tests were performed in shape detection under noise, with image retrieval from a MPEG-7 database and letter recognition. Numerical results show that the proposal is robust for noise perturbation, as well as, having adequate accuracy and hit rate, even with coarse tuning for its parameters. This makes the method attractive to a wide range of applications.

Keywords: Contour; feature extraction; shape representation–alignment; signature.

1. Introduction

Shape matching and point correspondence recovery play a fundamental role in many computer vision applications like object recognition, image database search, visual data mining, image retrieval, image registration and other related areas.[18,24,37,41] There are several ways to carry out the shape matching task. Feature-based shape

---

† Corresponding author.