Título   Modeling Video Activity with Dynamic Phrases and Its
Application to Action Recognition in Tennis Videos

Tipo de Producto   Libros y capítulos

Autores   J. Vainstein, J.F. Manera, P. Negri, C. Delrieux, A.G. Maguitman

Código del Proyecto y Título del Proyecto

A14T24 - Reconocimiento y Análisis de Acciones en Videos

Responsable del Proyecto

Pablo Negri

Línea

Procesamiento de señales

Área Temática

Informática

Fecha

2014

INTEC
Instituto de Tecnología

UADE FUNDACIÓN UADE

Modeling Video Activity with Dynamic Phrases and Its Application to Action Recognition in Tennis Videos

Jonathan Vainstein[1,2], José F. Manera[1,2], Pablo Negri[3],
Claudio Delrieux[1], and Ana Maguitman[2]

[1] Laboratorio de Ciencias de las Imágenes (IIIE - CONICET)
Departamento de Ingeniería Eléctrica y de Computadoras (DIEC)
[2] Grupo de Investigación en Administración de Conocimiento y Recuperación
de Información - LIDIA
Departamento de Ciencias e Ingeniería de la Computación (DCIC)
Universidad Nacional del Sur (UNS)
Av. Alem 1253, (B8000CBP), Bahá Blanca, Argentina
[3] Instituto de Tecnología
UADE-CONICET
Lima 717, Buenos Aires, Argentina

Abstract. We present a novel approach to action recognition in tennis shot sequences. The underlying model considers the per-frame motion to be regarded as a *word* (within an alphabet of possible motions), and the sequence of frames as a *phrase* whose meaning is determined by the words given in a specific order. This feature extraction mechanism allows a semantic treatment of the classification stage using Conditional Random Fields. The system was applied on the RGB videos of the THETIS dataset, achieving an accuracy of over 86% in recognizing 12 different tennis shots among several takes produced by 55 different amateur and professional players.

Keywords: Action recognition, conditional random fields, support vector machines, optical flow, motion description.

1   Action Recognition in Tennis Videos

The widespread availability of digital videos enables several development fields that requires automatic or semi-automatic video action labeling in different domains, such as action detection in surveillance systems [15], traffic accidents [8], and sports videos [19]. Some of these problems require efficient video processing and action detection methods that could be implemented in real time. In video processing of sport applications, it could be highly desirable to embed more sophisticated algorithms in low-cost cameras, for instance to be able to catch relevant actions instantaneously.

Publicación completa en: http://ir.cs.uns.edu.ar/publications/
download/68.pdf