

# 基于背景抑制和 PCNN 的运动目标检测

王健丞, 顾晓东

(复旦大学 信息科学与工程学院电子工程系, 上海 200433)

**摘要:** 提出了一个基于单位连接的脉冲耦合神经网络、光流、拓扑特性的新方法. 根据运动物体和其背景在一幅图像中存在速度的差异, 使用该方法对输入图像的每一个像素点的速度幅值进行计算, 并采用量化的速度幅值作为阈值决定该像素点属于物体本身还是背景. 并且, 通过使用单位连接的 PCNN 可以把整体性和连通性—最为重要的拓扑性质, 良好地运用在注意力选择的运动物体检测中. 实验结果表明, 在相同的实验条件下, 提出的方法在目标检测和背景抑制的效果优于其他类似的方法.

**关键词:** 目标检测; 拓扑性质; 注意力选择; 光流; PCNN 空洞滤波

## Moving Object Selection Using Background Suppression and PCNN

WANG Jian-cheng, GU Xiao-dong

(Department of Electronic Engineering, School of Information Science and Technology,  
Fudan University, Shanghai 200433, China)

**Abstract:** A novel object detection model based on Unit-linking PCNN, optical flow and topological property is proposed. In this paper, according to velocity differences between the moving object and its background, the approach calculates the velocity amplitude of each pixel of the image, through which the flow velocity amplitude are quantized using as threshold to decide whether a pixel is a part of an object or the background. Besides, using Unit linking PCNN whole filter expresses the connectivity and integrity, which are significant topology properties, in moving object attention selection. Experimental results on four databases indicate that the proposed method outperforms other methods both in detection accuracy and background suppression effect under the same conditions.

**Key words:** object detection; topological property; attention selection; optical flow; PCNN-hole filter

**作者简介:**

王健丞 男, (1989-), 硕士研究生. 研究方向为图像处理.

E-mail: 14210720044@fudan.edu.cn.

顾晓东 男, (1970-), 博士, 博士后, 教授. 研究方向为人工神经网络、图像处理、模式识别、生物建模等.