LOOKING AT PEOPLE
(Keynote talk)

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Abstract

The ability to recognize humans and their activities by vision is key for a machine to interact intelligently and effortlessly with a human-inhabited environment. Because of many important applications, “Looking at People” is currently the most active application domain in computer vision. This talk provides an overview of recent developments, with focus on methodologies for detecting, tracking people and recognizing their activities.

I discuss two main approaches to human body modelling and movement analysis. The appearance-based approach bypasses a pose recovery step and describes human appearance in terms of simple low-level features which are learned on a training set. I summarize the outcome of a large recent benchmark study on person detection [1], which examined multiple feature-classifier combinations with respect to their ROC performance and efficiency. What works best and how many training images are needed to adequately learn human appearance?

The model-based approach uses explicit prior knowledge of the (2D/3D) structure of the human body. It consists of a representation for the skeletal structure and the “flesh” surrounding it. I describe the shifting research focus from single- to multi-hypothesis tracking, and more recently, to pose/tracker initialization. What can be done to make these approaches more robust and applicable in practice?

The last part of the talk covers two Looking at People systems that we developed at DaimlerChrysler and University of Amsterdam over the past few years. The first involves driver assistance and pedestrian safety; I present results of real-time pedestrian detection [2] in urban traffic and on the test track (the latter in remarkable pre-crash experiments with real pedestrians). I furthermore preview a smart surveillance system for aggression detection in public spaces [3].

References


Biography

Dariu M. Gavrila obtained the MSc Degree in computer science from the Vrije University in Amsterdam in 1990. He received the PhD degree in computer science from the University of Maryland at College Park in 1996. He was a visiting researcher at the MIT Media Laboratory in 1996. Since 1997, he has been a senior research scientist at DaimlerChrysler Research in Ulm, Germany. In 2003, he was appointed professor in the Faculty of Science at the University of Amsterdam, chairing the area of Intelligent Perception Systems (part-time).

Over the past decade, Professor Gavrila specialized in vision systems for detecting human presence and activity, with application to pedestrian protection and surveillance. He published more than 20 papers in leading vision conferences and journals, and had several appearances in European broadcast and print media. His personal website is “www.gavrila.net”.