Chapter 7

A Brief Cartography of Smart Cameras:
Proactive Surveillance and Control

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ABSTRACT

This chapter carries out a brief cartography of the so-called "intelligent" video surveillance systems. These systems are programmed to accomplish real time automated detection of situations considered irregular and/or suspicious in specific environments, in order to predict and prevent undesirable events. Three aspects of the smart cameras are focused in this cartography. First, the author explores its regime of visibility and note how it prioritizes the capture of irregularities in the body's movements in urban space. Second, the author shows how the type of monitoring and profiling of bodies and behaviors in these systems generally acts at the visible, surface and infra-individual level of human conduct. Finally, he analyzes the temporality of smart cameras, especially in its proactive dimension that intends to foresee and intervene, in real time, in future events. The analysis of these three aspects of the intelligent video surveillance identifies and highlights discourses, processes and operations that are common to the exercising of power and surveillance in contemporary societies – more specifically, those which are included in the realm of control devices.

INTRODUCTION

We care what you do, not who you are. We aim to analyze and model the behavior patterns of people and vehicles moving through the scene, rather than attempting to determine the identity of people... We are trying to automatically learn what typical activity patterns exist in the monitored area, and then have the system look for atypical patterns that may signal a person of interest—perhaps someone engaging in nefarious behavior or a person in need of help." (James W. Davis, a computer-science and engineering professor at Ohio State University, describing the construction project of smart-camera networks that automatically track suspect behavior, 2009:30)

It is not uncommon for the more enlightened statements with regard to control mechanisms to be stated by the people who design them, rather than by social critics. Part of what we will deal with in this chapter has already been revealed, albeit in a condensed and controversial way, by the words of the inventor of a camera-based security system. This system is capable of tracking suspect or risky behavior by integrating multiple cameras which have high-resolution panoramic vision, geographic information systems (GIS), and "machine learning methods. This enables the computer to perform the kind of visual recognition that seems effortless for humans"[1]. According to the researcher:

We envision our research being applied to common urban surveillance tasks. To date, we have been focusing on the monitoring and analysis of pedestrian movement and activity...Other related applications we are considering include persistent tracking of vehicles through complex downtown environments and analyzing the traffic flows to look for atypical patterns. (Davis, 2009: 30)

Such a system is part of a new "generation" of so-called "smart" video surveillance[2] that heralds ways of monitoring behavior in an automated fashion. In most cases, the intention is for such cameras to recognize and differentiate regular patterns (which are considered to be safe) of conduct and occupation of spaces from irregular ones (which are categorized as suspect, dangerous, or simply non-functional). These "smart cameras" or "intelligent video surveillance" consist of software[3] that can be added on to cameras in order to filter or read images according to algorithms and point out individuals, objects, and/or attitudes that should be the focus of attention of the "scene". This is carried out in accordance with pre-defined applications in the system. For example, a body stopped for a certain period of time very near the safety line beside the tracks at a subway station should be automatically pointed out on the

surveillance screen so that intervention can take place in time to impede the possible lethal leap of a potential suicide victim. This same device can also automatically pinpoint the following on the screen: an object that was left in the station, individuals or groups of people behaving suspiciously, bodies moving against the flow, or any situation previously categorized as needing to be highlighted in the machine's and/or camera operators' field of attention. In technical terms:

Intelligent visual surveillance systems deal with the real-time monitoring of persistent and transient objects within a specific environment. The primary aims of these systems are to provide an automatic interpretation of scenes and to understand and predict the actions and interactions of the observed objects based on the information acquired by sensors (Velastin & Remagnino, 2006: 1).

Computational vision, pattern analysis, artificial intelligence, and data management are some of the subjects and techniques involved in the construction of such systems. They rely on applications in the most varied sectors: safety, administration, transportation, commerce, and entertainment, among others. The tasks they can perform, and which are always in real time, are also varied: detection, classification, and tracking of objects, people, behavior, movements, and human activities; classification and interpretation of human behavior; detection of changes in the context or the pattern of how individuals or crowds occupy spaces; identification, etc. This broad range of functions and applications is visible in products currently on the market of smart video surveillance. ADVISOR (Annotated Digital Video for Surveillance and Optimised Retrieval), for example, which focuses on surveillance in the area of public transportation, includes automatic incident detection, content-based annotation of video recordings, and individual and crowd behavior pattern analysis. ISCAPS (Integrated Surveillance of Crowded Areas for Public Secu-

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