RIPS2015 LAPD Project: Machine Learning for Police Body-Worn Video

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Introduction

Surprisingly little is known about most interactions between police and the public. What little we do know is filtered through partial descriptions found in written reports and coarse-grained, codified activity logs. Occasionally, video captured by third parties shows police-public interactions, but these often come to light only following adverse outcomes and are far from representative. As a result, there are many questions surrounding the nature and diversity of police-public interactions that are both technically and practically impossible to answer.

Body-worn video (BWV) or on-body cameras provide a novel means to collect very fine-grained information about police-public interactions. BWV is recorded in real-time from chest-mounted video cameras as police officers go about their day-to-day duties. BWV is not recorded continuously, but rather is initiated by the officer and is uploaded at the end of the shift to secure data storage facilities.

BWV is designed to provide another line of evidence for the actions of individuals and the outcomes of interactions between police and members of the public. BWV is therefore evidence relevant to legal proceedings like any other form of evidence collected by police. In a limited number studies, BWV has been shown to change the nature of interactions between police and public and thereby reduce police use of force. In general, 'audience effects' induced by knowing that the interaction is being recorded seems make escalation less likely.

There are considerable challenges facing the real-world use of BWV, however. Even small scale deployments are expected to lead to massive volumes of video data that will quickly outstrip the ability of law enforcement agencies to analyze. The resulting fallback position will be to review BWV footage only when it corresponds to adverse outcomes (e.g., use of force). Most video will go unused. Many of the potential benefits of BWV may therefore go unrealized.

The 2015 LAPD-RIPS Project

The 2015 RIPS-LAPD team will work on a targeted problem related to LAPD use of BWV. The project will rely on a range of data types including crime data, calls-for-service data, BWV metadata (e.g., time stamps), BWV content tags, BWV audio, and the video images themselves. One specific problem tackled in 2015 will center automated methods for detecting when BWV

includes footage involving a foot chase. Furthermore, the LAPD is interested in estimating properties of the foot chase (e.g., relative motion patterns between officer and subjects).

Computations may be done in Matlab, Mathematica, C, C++, R, Java, or other appropriate computational language.

Key Milestones:

1. Statistical assessment of LAPD BWV and other associated data.
2. Review semi-supervised machine learning methods as applied to geotagging and related problems (e.g., topic modeling).
3. Develop machine learning methods.
4. Testing of efficacy of geotagging.
5. Present to LAPD.

References

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