DATASAFE: understanding Data Accidents for TrAffic SAFEtty Acknowledgments
Aleksandra Malkova, Julyan Arbel, Maria Laura Delle Monache

To cite this version:
Aleksandra Malkova, Julyan Arbel, Maria Laura Delle Monache. DATASAFE: understanding Data Accidents for TrAffic SAFEtty Acknowledgments. Bayesian learning theory for complex data modelling Workshop, Sep 2018, Grenoble, France. pp.1. hal-01950663

HAL Id: hal-01950663
https://hal.archives-ouvertes.fr/hal-01950663
Submitted on 11 Dec 2018

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L’archive ouverte pluridisciplinaire HAL, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d’enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.
Aim and data

Our aim is to understand if there exists a particular link between speed and density of cars at which collisions are more likely to occur. We intend to make use of raw sensor data collected on the Rocade Sud in the framework of the Grenoble Traffic Lab (https://gtl.inrialpes.fr/data_download) using data for different days of the week and different day time. The sensor data consists of these quantities collected every 15 seconds: flow, occupancy and speed.

Fundamental diagram

The fundamental diagram is the main tool used in traffic flow to understand traffic characteristics. It is the graph that links the flow and the density. In this project, we study how the fundamental diagram depends on time and day of the week, weather conditions, characteristics of the road and local traffic rules. In particular, we are interested in understanding if certain particular road conditions can be linked to the generation of accidents.

Data summaries

To understand the data firstly we analyzed the distribution of the main parameters of traffic flow. In Figures (2-3) there are distributions of the speed, occupancy and flow for each day of the week.

Future work

We will derive traffic density and flow rate from the sensor data by first reducing the data dimensionality (PCA). Then using state of the art Bayesian statistical learning, building upon [1], and clustering techniques we will analyze traffic behavior during periods of time that precede the accidents from which we will derive traffic patterns.

Acknowledgments

This project was developed in the framework of the Grenoble Alpes Data Institute, supported by the French National Research Agency under the “Investissements d’avenir” program (ANR-15-IDEX-02).

References