

# Safety Line: big data applied to air transport

*Risk estimation in air transport using machine learning*

H2020 SOCIETAL CHALLENGES: A changing world - inclusive, innovative and reflective societies

PRODUCTIVE SECTOR: Logistics and Transport

## PROBLEM DESCRIPTION

The data from airplane's flight recorders (black boxes) are stored by companies, but they remain unused, except. When an incident occurs.

Our idea is to detect risky situations from these data, even for an eventless flight

## CHALLENGES AND GOALS

Develop an algorithm to detection of risky flights and to find variables which could be related to these risks. Propose a ready-to use implementation.

## MATHEMATICAL AND COMPUTATIONAL METHODS

The aim of this work was to use machine learning techniques on flight data. The objective was to use a bottom-up strategy, starting from the question of finding flights which were potentially dangerous, even though no accident occurred. A first analysis indicates that data are highly dependent. Random forests were successfully applied to select relevant data from the events under consideration. This method was afterwards extended to multivariate functional data, allowing for the use of more general criteria.



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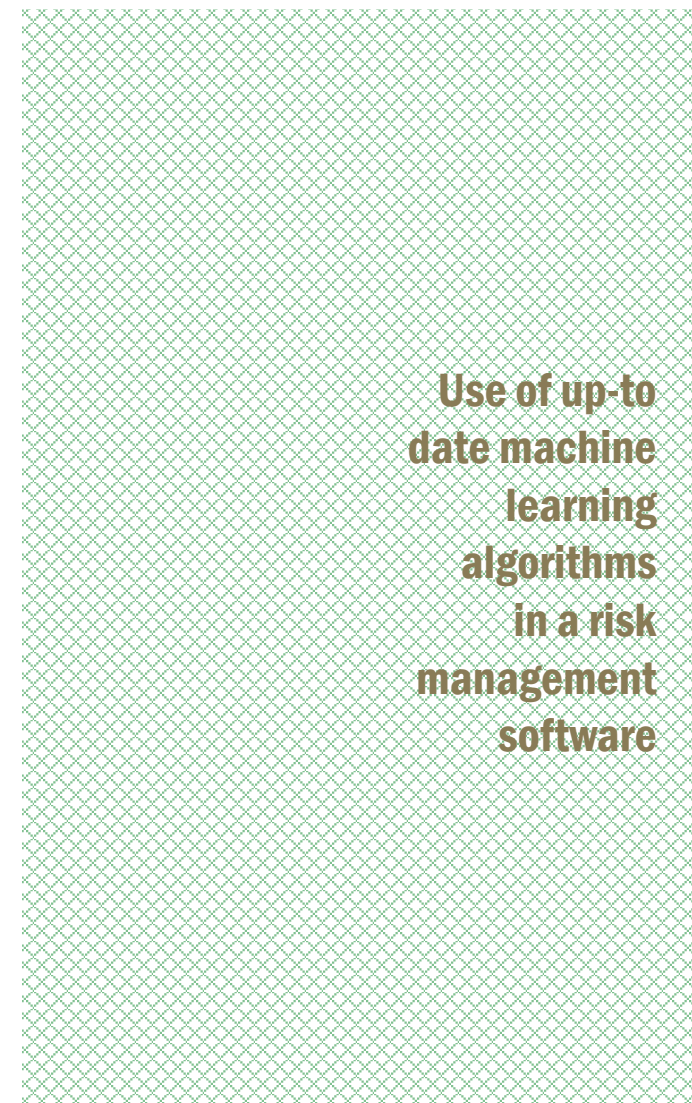
## Results and Benefits

The method proved to be efficient in several relevant use-cases. A software was developed, using this algorithm: FlightScanner. This software is now available as a product of the company.

The presented work was Baptiste Gregorutti PhD, supervised by G. Biau, B. Michel, and P. Saint-Pierre. Since then, B. Gregorutti has been hired as a researcher in data science then as a research manager



New product allowing for efficient data analysis of flight data



**Use of up-to date machine learning algorithms in a risk management software**



LPSM



**SAFETY LINE**  
Big Data applied to Aviation

Safety Line