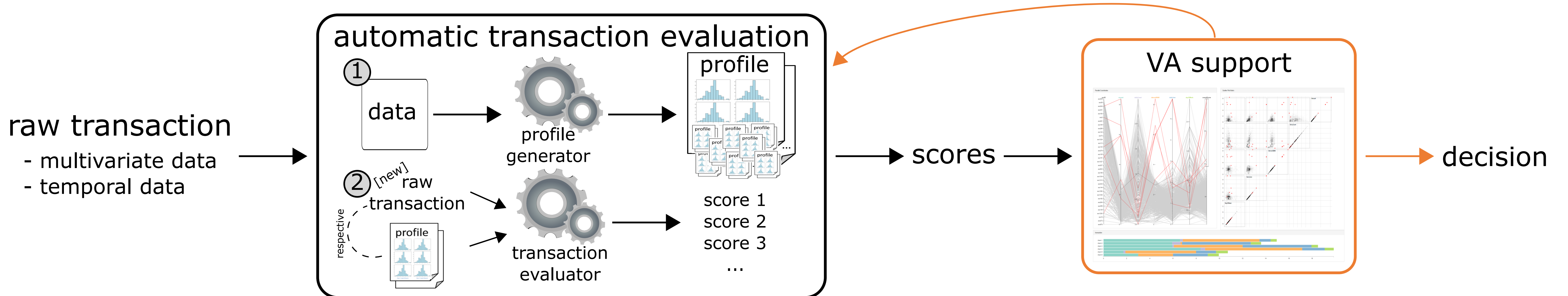


# Visual Analytics for Fraud Detection: Focusing on Profile Analysis

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## Data

Financial transaction events.

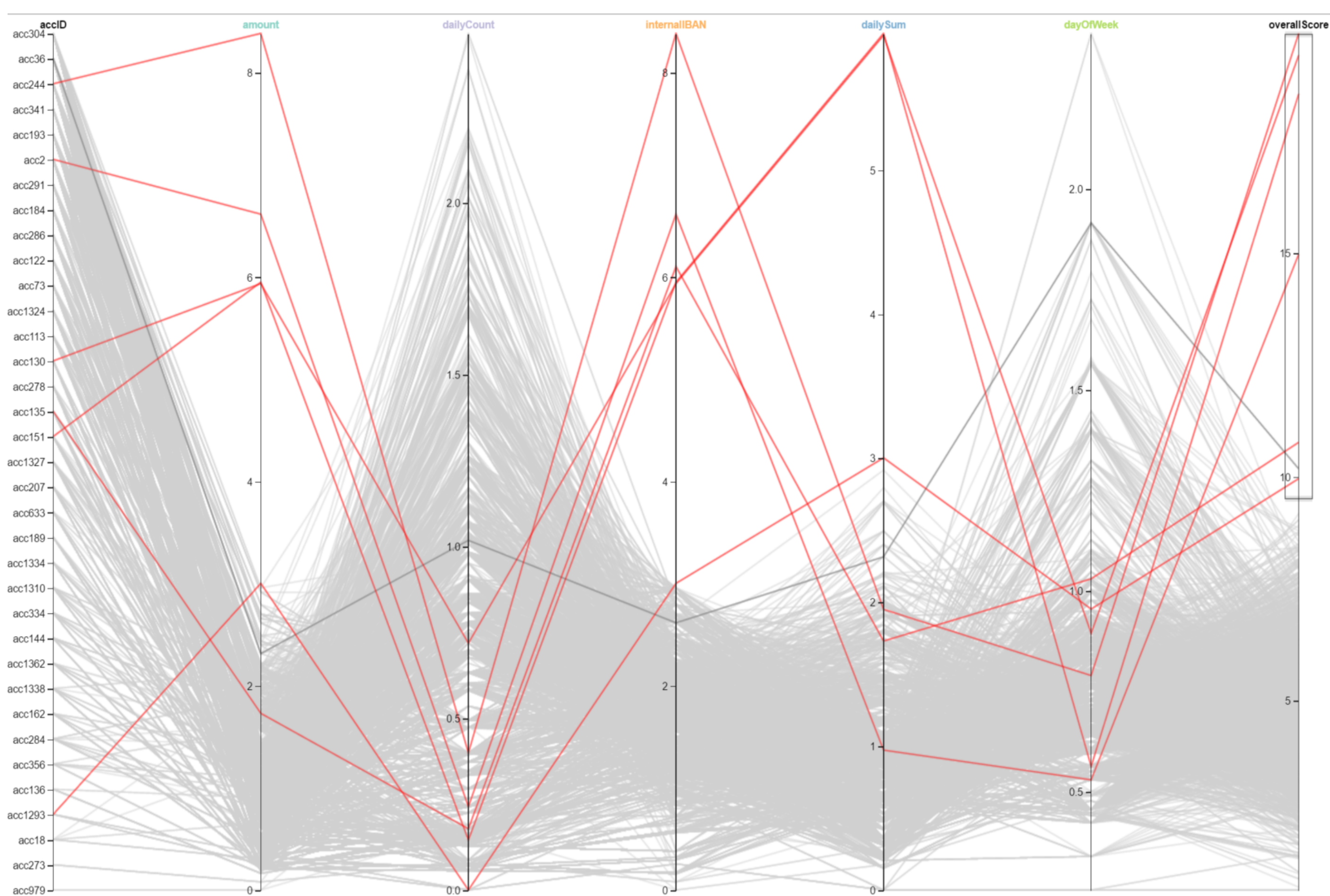
## User

Analysts from financial institutions.

## Task

Fraud detection by means of profile analysis.

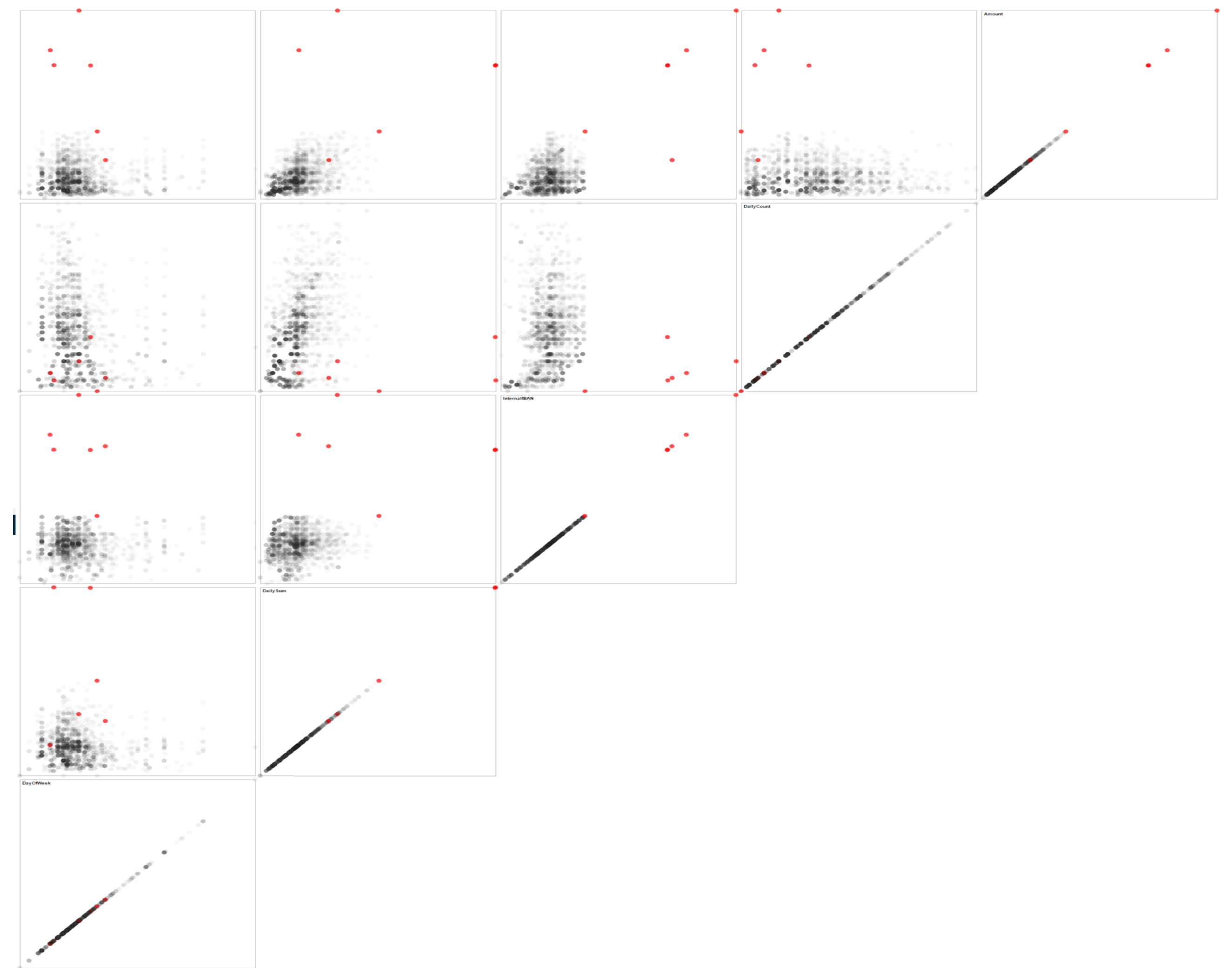
## Our approach



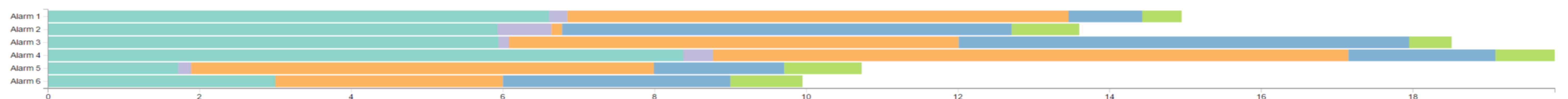
Parallel coordinates were used to visualize vary transactions. Red lines stand for transactions that were considered suspicious during the automatic system analysis. Each axis represent a different dimension that form a final score of harmfulness.

## Abstract

**Financial institutions** are always interested in ensuring security and quality for their customers. Banks, for instance, need to identify and avoid harmful transactions. In order to **detect fraudulent operations**, data mining techniques based on customer profile generation and verification are commonly used. However, these approaches are not supported with Visual Analytics techniques yet. We propose a Visual Analytics approach for supporting and fine-tuning **profile analysis** and **reducing false positive alarms**.



Each dot in the scatter plot represents a transaction. Red dots are transactions alarmed by the system. The idea is to visualize relationships and common outliers between dimensions.



Stacked horizontal bar charts show selected alarm transactions final scores. Colors are encoding different dimension that construct a final score.

## Contribution

- Summarization of the main challenges of fraud detection focusing on customer profile analysis.
- Propose of a VA approach for profile analysis to support fraud detection and user monitoring.
- We integrate a VA approach into the fraud detection process to efficiently combine AI techniques with interactive visualmeans.

- Prototype implementation of a VA approach for the investigation of suspicious behavior and fine-tuning of automatic alert systems.
- We believe that our approach may as well be applicable in similar monitoring techniques and in similar domains such as malware detection and tax usage analysis.