



## ANOMALY DETECTION FOR CONTROLLING

Researchers in the Financial Mathematics department, together with industry partners, have developed an anomaly detection software. The product enables users to find and assess various types of anomalies (outliers) in very large data sets – usually, in accounting data.

1 *Example of detection of suspicious messages*

### Identifying anomaly types – developing efficient algorithms

Our software lets us define various anomaly types tailored for the actual use case. In almost all projects, we detect mathematically simple anomalies, such as duplicate statements. However, deviations from the Benford distribution are also found and examined. Furthermore, we implemented a number of clustering methods that find, for example, highly deviating invoices in a large set. We also apply machine learning methods to define detection algorithms. In all cases, the development of efficient algorithms is an essential research task in the associated projects.

### Software provides optimal support of workflows

The software we develop is optimally adapted for workflows encountered in controlling. Multiple users such as administrators, employees, and team leaders can work at the same time. The anomalies detected by the software can be viewed by all users who, if required, can check the underlying files or procedures to classify the anomaly according to severity or amount of damage. The users comment on or classify each stage of an anomaly, while a revision proof history of all work on an anomaly is maintained.

Lastly, our software approach permits a structured assessment of the data, for example, sorting and filtering as well as supporting an Excel export of all data and results.

