MSc thesis internship –
Anomaly Detection on Transaction Volumes

Topic description
Time series anomaly detections on different transaction streams

Processing payment transactions is an important task for a bank: being able to make payments in a reliable and secure way forms the basis of economic and societal activities. The impact of errors in transaction processing could be huge. Although significant efforts are put into reducing the number of incidents, human error, technological failure and system change introduce a non-zero risk. As incidents might occur, it is vital they are detected instantly. Different types of transactions are handled in separate streams with differing characteristics.

The challenge of detecting erroneous transaction streams can be phrased as a time series anomaly detection problem. The system should avoid false positives as every reported anomaly results in an expert investigating the suspected faulty systems. Furthermore, the detection should happen in an online fashion so that experts can prevent any further damage. Although a system that can handle all types of streams is preferred, the biggest challenge currently lies with the smaller streams as these are drowned out by the larger ones.

Additional challenges are introduced by changes to underlying systems, resulting in systematic changes to the transaction streams. Changes include removal and introduction of streams, repurposing of streams and gradual rerouting of streams resulting in sudden changes in stream behaviour (e.g. 'system shocks'). Learning paradigms such as transfer learning and one-shot learning might mitigate these system shocks. Furthermore, anomaly detection on separate streams might be improved by using global patterns that occur across streams.

About ING
ING is transforming rapidly towards a top notch IT company with a Top Engineering culture, incorporating FinTech start-up mentality and financial innovation. We are end-to-end agile, work in multidisciplinary teams and use cutting edge technology. This enables us to offer our customers the best possible service and respond to rapidly changing customer demands.

You will be working in the ING’s Core Banking University, this is where science and business meet. Within this department top experts from both areas are collaborating on the next-generation digital bank.

Requirements
We are looking for a Master student that can meet the following requirements:

- Bachelor degree in a data science-related field, with great results. Affinity with topics anomaly and outlier detection, statistical models, machine learning and deep learning.
- The ability to learn quickly and explore new topics.
➢ Affinity with a cooperate research environment
➢ Data science experience (e.g. projects or working experience besides your study)
➢ Fluent in English

Interested?
Please get in contact with us: send your CV and grade lists (BSc and MSc so far). If you have any other topic ideas, you can send them as well. Please be aware that a Certificate of Good Conduct and positive Pre-Employment screening are required.

Joost Bosman, IT Manager, ING: joost.bosman@ing.nl