Customer Relationship Network for Credit Card Default Prediction

Skandere Sahli & Arie Selinger

Faculty Advisor: Prof. Stephen Graves  |  Neon Advisor: Andre Luiz Catini Paro

Neon is a Brazilian Fin-Tech leader offering retail banking services

How can we use relationship’s data to improve credit risk models?

Network’s subgraph coloring nodes by their customer segment

Connected customers are 64% more likely to share the same segment than for random customers

How traditional credit default models work

Design of a Relationship Network using transfers and invitations

Four populations on which we evaluate our models

Relationship Features Model
Relationship’s data is aggregated into new features fed to an XGBoost model

Supervised GraphSAGE Model
A deep learning model on graphs generates node embeddings that are fed to an XGBoost model

Monthly evolution of our KPI on the OpenSea population

On the OpenSea population, relational models add more signal than noise.

Business Impact
- Increase credit card approvals, hence profit
- Decrease costly customer churn for customers rejected at registration
- Reduce to 30 from 90 days credit limit reassessment for customers approved at registration