Fraud Transaction Detection: Project Report

Nature Inspired Computing

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Project Description

Application of nature-inspired algorithms to the problem of fraud transaction detection in banking systems.

- Fraud detection is a critical task in banking systems
- Most common approach is Machine Learning
- We propose to use nature-inspired algorithms to fine-tune ML models to get better results

Reference Work

Our project was inspired by the following project: `https://github.com/pmacinec/transactions-fraud-detection` Our project's contribution is the following:

- Comparison with gradient boosting algorithms
- Application of NIC algorithms to the gradient boosting algorithms

Results

Table: ROC AUC of ML models with NIC feature selection

Method	CatBoost	LightGBM	DecisionTree
Original Score	**0.893**	0.909	0.835
Artificial Bee Colony	0.887	0.906	0.836
Cuckoo Search	0.891	0.905	0.842
Bat Algorithm	0.889	0.909	0.842
Firefly Algorithm	0.892	0.907	0.844
Flower Pollination	0.891	0.906	**0.846**
Grey Wolf Optimizer	0.892	**0.913**	0.844
Particle Swarm	0.892	0.912	0.845
Algorithms better than baseline	0	2	7

Conclusion

- NIC algorithms for feature selection do not improve performance of gradient boosting models
- We hypothesize that the reason for such difference in results between single tree and ensemble is that single tree is more prone to overfitting

Thank you for your attention!