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Towards Scalable, Efficient and Privacy Preserving Machine Learning
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Context and Motivation

- Minimize the computational costs incurred by privacy preservation.
- Provide an end-to-end privacy preserving outsourced data classification service.
- Enable a set of mutually untrusted data owners to have a global vision on the union of their data without breaching the privacy of each one of them.
- Enable dynamic data model updates when new training data samples are available.

Related work

- Clustering (1)
- Classification (2)
- Association Rule Mining (3)

Different ML algorithms

- PPML

Different Privacy-preservation objectives

- ML output protection
- Original data protection

Privacy Preservation techniques

- Cryptographic techniques (SMC/HE, GC, OT)

Design principles

- Decent privacy and utility levels
- Efficient runtime
- Entirely outsourced ML computations over encrypted data

Objecitives

- Use building blocks
- Combinete PHE with cryptographic blinding
- Minimize the computational costs incurred by privacy preservation.

Preliminary results

- We have used a synthetic dataset for fraud detection in a B2B network.
- This dataset contains 1000 bank transactions with 9 attributes each.
- We compare our work to the Ciphermed framework [8].

References