Open Thesis (BA/FA/MA)

Encrypted Portfolio Optimization with Private Information

Description:

Homomorphic cryptosystems enable the evaluation of functions on encrypted data. This technology provides new possibilities for private cloud computing and for encrypted control. We are currently developing a framework for optimization with private cost functions or constraints using homomorphic encryption. This project focuses on applying this framework to enable the private and secure optimization of investment portfolios. This is particularly interesting in that multiple analysts do not want to reveal their personal expert view on the market, but would benefit from a joint evaluation of the market. Using encrypted optimization, the private data could be merged into an overall asset recommendation. The thesis could consider different models of asset optimization, e.g., Modern Portfolio Theory's mean-variance optimization or Black-Litterman models, and evaluate their compatibility with encrypted optimization.

Prerequisites:

- Interest in encryption and optimization.

Supervisor:

Sebastian Schlor
Room 2.234

Area:

Encrypted Control Optimzation

Properties:

Type: **BA/FA/MA**

30% literature
50% theory
20% implementation
up to discussion

Beginning:

any time

Further information on www.ist.uni-stuttgart.de/lehre/bama

Aushang vom June 11, 2025