Protection of Sensitive Information

Proposal for a PhD course of 30 h

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1   Motivations and history of the topic (1 h)

2   Anonymous communication (total: 5 h)

- Crowds (1 h)
- Tor (1 h)
- DC Nets (1 h)
- Probabilistic definitions of anonymity (2 h)

3   Privacy protection in datasets (total: 12 h)

- Privacy protection via k-anonymity and ℓ-anonymity techniques (2 h)
- De-anonymization attacks (2 h)
- Differential privacy (4 h)
- Trade-off between privacy and utility (2 h)
- Extensions of differential privacy (2 h)

4   Location privacy (total: 3 h)

- Cloaking and triangulation attacks (1 h)
- Optimal Bayesian approaches (1 h)
- Geo-indistinguishability (1 h)

5   Quantitative Information Flow (total: 9 h)

- Vulnerability and entropy – operational interpretation (1 h)
- Information-theoretic approaches (3 h)
- Relation with differential privacy (1 h)
- Decision-theoretic approaches: g-leakage (2 h)
- The lattice of information (1 h)
- Axiomatization (1 h)