

Paul Walther

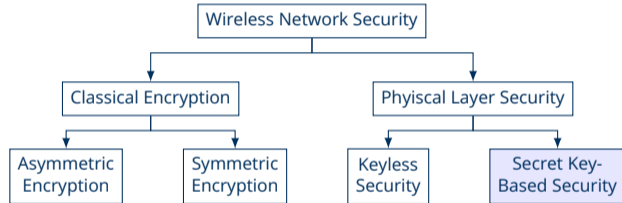
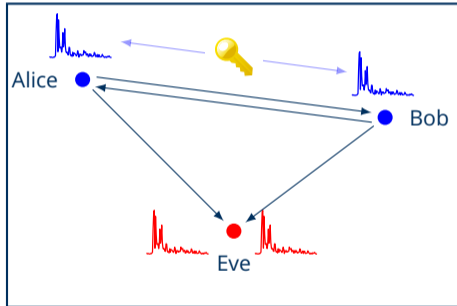
TU Dresden, Computer Science, Chair of Privacy and Data Security

# Thesis Topics

Dresden, June 17, 2020

# General scope: Physical Layer Security

## Channel Reciprocity based Key Generation



# Soft decision ECC for Information Reconciliation

PLS/CRKG

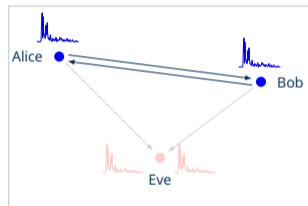
**Reciprocal measurements** do have **slight differences**

Removed in Information Reconciliation after Quantization

**ECC codes** can work with **real valued data**

Tasks:

- Implement appropriate soft decision ECC
- Realize reconciliation with existing measurements
- Compare metrics against hard decision baselines



# Channel Model Attack

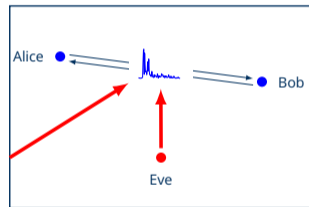
PLS/CRKG

**Attack CRKG** by **precalculation** of channel properties

More refined channel models proposed

Tasks:

- Implement attack using `pylayers`
- Realize attack with existing measurements
- Compare resulting bit vectors to CRKG results



# Robust peak detection

PLS/CRKG

**Channel properties** are determined by **peaks**

Peaks potentially **overlap** and/or are **not prominent**

Possible approaches: classical peak detection, blind source separation, ML

Tasks:

- Select/develop robust peak detection
- Implement approach using Python
- Evaluate on measurements and synthetic data

