

FEC Code Design for Long Distance CV-QKD System

Bachelor's Thesis/Master's Thesis

Project

This thesis aims to enhance the error correction sub-system of the continuous-variable quantum key distribution (CV-QKD), a secure communication technique based on quantum mechanics principles.

A significant challenge in implementing CV-QKD is the design of highly efficient channel codes capable of correcting errors arising from the noisy quantum channel and imperfect detection devices. While it is true that channel codes designed for binary input Additive White Gaussian Noise (AWGN) channels can be utilized in CV-QKD systems, they fail to capitalize on the side information that the transmitter may possess regarding the channel.

To address this issue, this thesis will leverage the additional information on the channel to augment the error correction performance of the CV-QKD.

Tasks

1. Learning how to design graph-based codes using methods
2. Implementing various code design methods in the software
3. Evaluating and comparing the code performance

Requirements

- ✓ Interest in Channel Coding
- ✓ Good skills in MATLAB/Python/C++

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