# Quantum Algorithms for Optimizing Urban Transportation

## Original Proposal:

This master's thesis proposal aims to explore the emerging field of quantum computing in the context of solving optimization problems. Quantum computing offers the potential to overcome classical computational limitations and achieve more efficient solutions in a number of areas, including the optimization of complex systems. This research will focus on developing quantum algorithms that can be applied to a specific optimization problem, which will be defined at a later date.

## Application to Transport Optimization

This master’s thesis explores the field of quantum algorithms applied to the domain of transport optimization, with a particular focus on the reduction of commuting times, energy consumption, carbon emissions, and the efficient use of vehicles. In a theoretical urban setting devoid of private vehicles, the research endeavors to design a quantum algorithm capable of optimizing public transportation systems to provide citizens with seamless, eco-friendly, and energy-efficient travel experiences. This thesis also examines the feasibility of integrating such a system alongside vehicles owned by external parties.

Drawing inspiration from the quantum version of the vehicle routing problem, the study aims to create an algorithm that can adaptively allocate resources, such as large buses and small cars, based on real-time demand and the geographical distribution of passengers. By harnessing the power of quantum computing, this research aims to explore a novel approach to urban transportation, contributing to a greener, more sustainable future while simultaneously enhancing the overall transportation experience for residents.

## Related Papers:

- Quantum computing for transport optimization
- Intelligent Bus Operation Optimization by Integrating Cases and Data Driven Based on Business Chain and Enhanced Quantum Genetic Algorithm