

# Exploring Scalability and Performance in 5G Networks through Digital Twin Simulations with OMNeT++/Simu5G

## Master's Thesis

### Project

This thesis explores the scalability and performance of 5G networks using Digital Twin simulations with OMNeT++/Simu5G. A Digital Twin is a virtual representation of real-world assets, enabling continuous data integration and analysis for monitoring, simulating, and optimizing systems. In the context of 5G networks, Digital Twins provide a dynamic environment to test various configurations and performance scenarios without impacting real infrastructure. By leveraging these simulations, the thesis aims to identify strategies to improve network scalability and performance in 5G environments.

### Tasks

1. Build a simulation environment using OMNeT++ and Simu5G.
2. Create and test various network scenarios, including adding/removing base stations and adjusting user densities.
3. Evaluate performance of different configurations.
4. Recommend strategies for optimizing the network performance.

### Requirements

- ✓ Programming knowledge (C++/Python preferred but not required).
- ✓ Motivation to learn and work with new tools like Ubuntu, OMNeT++, and Simu5G.
- ✓ Interest in network simulations and 5G technologies.

### Institute

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