

# Simulators for Internet of Things and Wireless Sensor Networks

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| <b>Prerequisites:</b>          | - Technical background in communication technologies / protocols |
| <b>Recommended background:</b> | - Internet of Things<br>- Network Simulation                     |
| <b>Level:</b>                  | This topic is appropriate for Master Students                    |
| <b>Language:</b>               | German or English  |

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## INTRODUCTION

The Internet of Things (IoT) is one of the most important emerging technologies, spanning a myriad of possible applications. It is very practical to be able to simulate the work of such systems and applications before actual deployment. The goal of this project is to explore the landscape of available simulators and to identify their main properties. The usability of these simulators is also an important aspect.

## PROJECT DESCRIPTION

The individual steps are:

- Conduct an online survey about currently available IoT and wireless sensor networks simulators. Other related concepts, which might help in finding the simulators are cyber-physical systems, embedded computing or smart city. Some simulators to start with are OMNeT++ and Cooja.
- For each simulator, explore its properties and available models, such as programming language, business model, hardware supported, communication technologies models, networking protocol models, traffic models, application scenarios, energy harvesting / consumption models, battery models, environmental models, radio propagation models. Prepare a comparative table with all information. Identify the most sophisticated simulators (minimum 2, maximum 4).
- Define a small general IoT scenario with several sensing nodes and some actuators with a popular communication technology (e.g. LoRa or ZigBee) and implement in each of the previously identified sophisticated simulators. Discuss the usability of the process (available tutorials for learning, mailing list and forum for support in case of problems, quality of implementation, result evaluation and presentation).
- Documentation and presentation of the work.

## CONTACT

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