



NEUROROBOTICS

**SIEMENS**

# Thesis Call



TECHNISCHE UNIVERSITÄT  
IN DER KULTURHAUPTSTADT EUROPAS  
CHEMNITZ

## AI-Supported Test Case Generation from Feature Specifications

(in Cooperation with Siemens)

In modern software engineering, increasing system complexity makes automated quality assurance essential. Especially in early development phases, a key challenge is how to automatically derive executable test cases from textual specifications. This master's thesis aims to develop an approach that leverages modern AI technologies to support and largely automate the generation of test cases. Large Language Models (LLMs) will serve as the central component to analyse, structure, and transform specification content into executable tests. The goal is the conceptual design and technical implementation of an end-to-end system that:

- autonomously learns an internal test language by analysing and abstracting existing test cases,
- automatically generates test cases from use cases, scenarios, and functional requirements in the specification,
- outputs them in a formally correct representation of the learned internal test language.

A complete development and test platform is available for the project. Since specifications and examples are predominantly written in English, strong proficiency in both German and English is required.

### Advisor:

- Prof. Florian Röhrbein, [florian.roehrbein@informatik.tu-chemnitz.de](mailto:florian.roehrbein@informatik.tu-chemnitz.de)

### Requirements:

- Ability to align and reconcile specifications, internal test language structures, and AI model outputs.
- Optional extension: design of a semi-automated collaboration workflow between developers and AI agents (human-in-the-loop).
- Strong proficiency in German and English.

