

Elective module “Formal Specification and Verification”

Lecturer	Prof. Dr.-Ing. Ruth Schorr
Module Components	2 SWS lecture, 2 SWS exercises
Preliminary Examination	Laboratory exercises with written assignment, processing time 80 hours
Module Examination	Written examination (90 minutes)
Further Information	Lecture: Monday, 10:00 – 11:30, Room 1-130 Exercises: Friday, 14:15 – 15:45, Room 1-252 or Friday, 16:00 – 17:30, Room 1-252

Keep in mind to register for every preliminary and module examination on the HIS-platform within the published time frame.

Short Outline of elective module contents

Model checking is used in various areas: model checkers analyse chip designs for correctness to avoid bugs like Intel's FDIV bug and F00F bug. Model checking was used to prove that the software of the Mars Pathfinder software is free of deadlocks. Modules of Deep Space 1 space craft have been analysed with model checkers. To verify properties of the storm surge barriers on the Nieuwe Waterweg the model checker SPIN with modelling language Promela was used.

The course provides an introduction to the main principles of model checking:

- Modelling reactive systems by transition systems
- Modelling reactive systems with SPIN and Promela
- Linear time properties and Büchi automata
- Linear temporal logic and automata-based model checking