

Possible topics for master thesis at Chalmers/GU – Laura Kovács:

- **Invariant generation in Key:**
 - experiments with various existing methods for invariant generation;
 - integration of some of these method in Key.
- **Invariant generation and automated theorem proving:**
 - experiments with the first-order theorem prover Vampire;
 - experiments with Vampire for invariant generation;
 - analyze experiments and strengthen invariants by adding new properties.
- **Proving program properties over various data structures:**
 - experiments with the first-order theorem prover Vampire;
 - analyze experiments;
 - add missing theory axiom/properties to Vampire.
- **Software engineering and theorem proving:**
 - verify the correct behavior of self-parking cars;
 - simulate parking cars and generate various scenarios;
 - use the the first-order theorem prover Vampire to prove scenarios correct.