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Bonn-Rhein-Sieg
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b-it Bonn-Aachen
International Center for
Information Technology

SDP- Midterm Presentation
Adaptive Deployment of Safety Monitors for Autonomous Systems

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Recap of project goals

- Reframe deployment planning as a Constraint Satisfaction Problem
- Implement the algorithm
  - To select an optimal monitoring strategy
  - To identify the best matching platform for the safety monitor based on given context
- To validate the algorithm using the generated test data
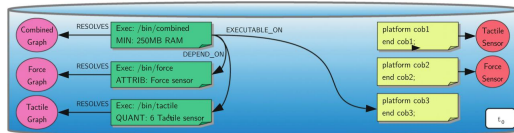
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Requirements

An illustration of platform selection

- The force slip detector should be deployed on a platform to which the force sensor is connected.
- The tactile slip detector should be deployed on a platform to which all tactile sensors are connected.
- The combined slip detector should be deployed on a platform with at least 250MB working memory.

Code development

- Mini Zn model to propose suitable existing platforms for every slip detector.**(platforms.mzn)**
- An initial version of the Python driver code that loads and utilizes the model. **(python driver)**
- Skeleton code consisting of potential classes that form the Adaptive Deployment system **(skeleton code)**

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Driver code - python

- MiniZinc API for python.

- Importance of models and solvers.

- Data for the MiniZinc model can be obtained during runtime or compile time.

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General code skeleton

- The code consists of two classes namely,
    1. Repository
    2. Safety monitor

- **Repository** is the central component in the architecture. It contains knowledge for deployment of safety monitor in platforms.

- **Safety monitor** class performs selection of the safety monitor followed by a finding the suitable platform to deploy them.

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Next steps

- Add soft-constraints to the Mini-Zn model to find the best platform(if more than a assignment possible) for a slip-detector.

- Handle corner cases in platform assignment.

- Extend and concretize the existing code skeleton.

- Integration of driver, components and the Mini-Zn model.

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