

The A-maze-ing Challenge

1. “Task-Skill-Motion”- framework
2. Composition Pattern
3. Deployment of CP
4. Questions

Group #2

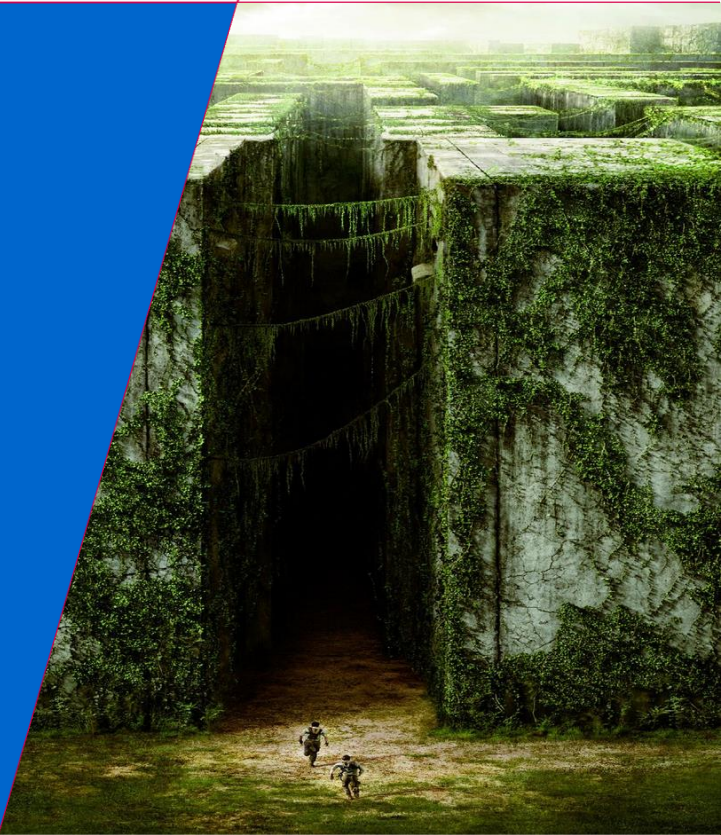
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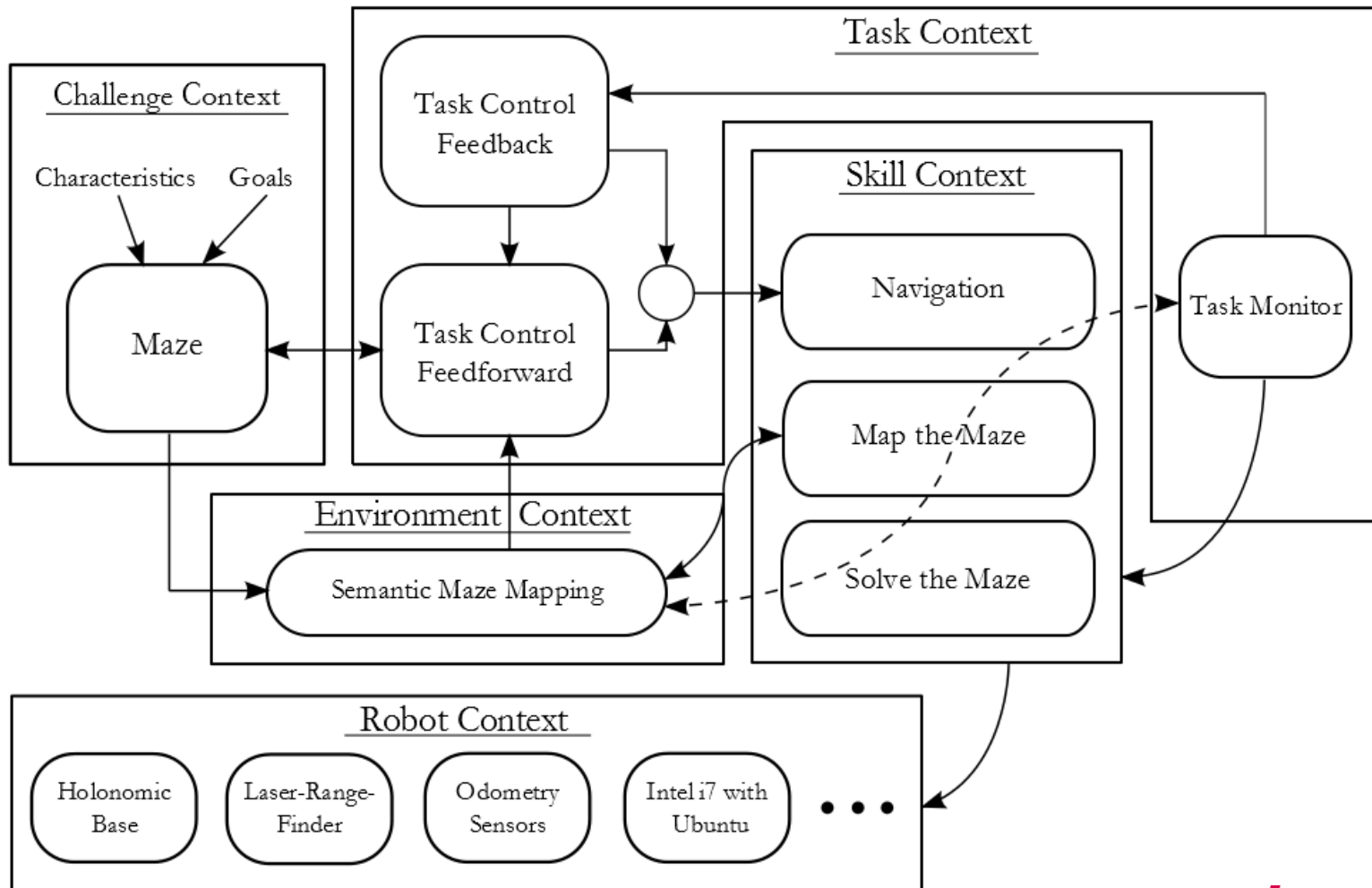
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Where innovation starts

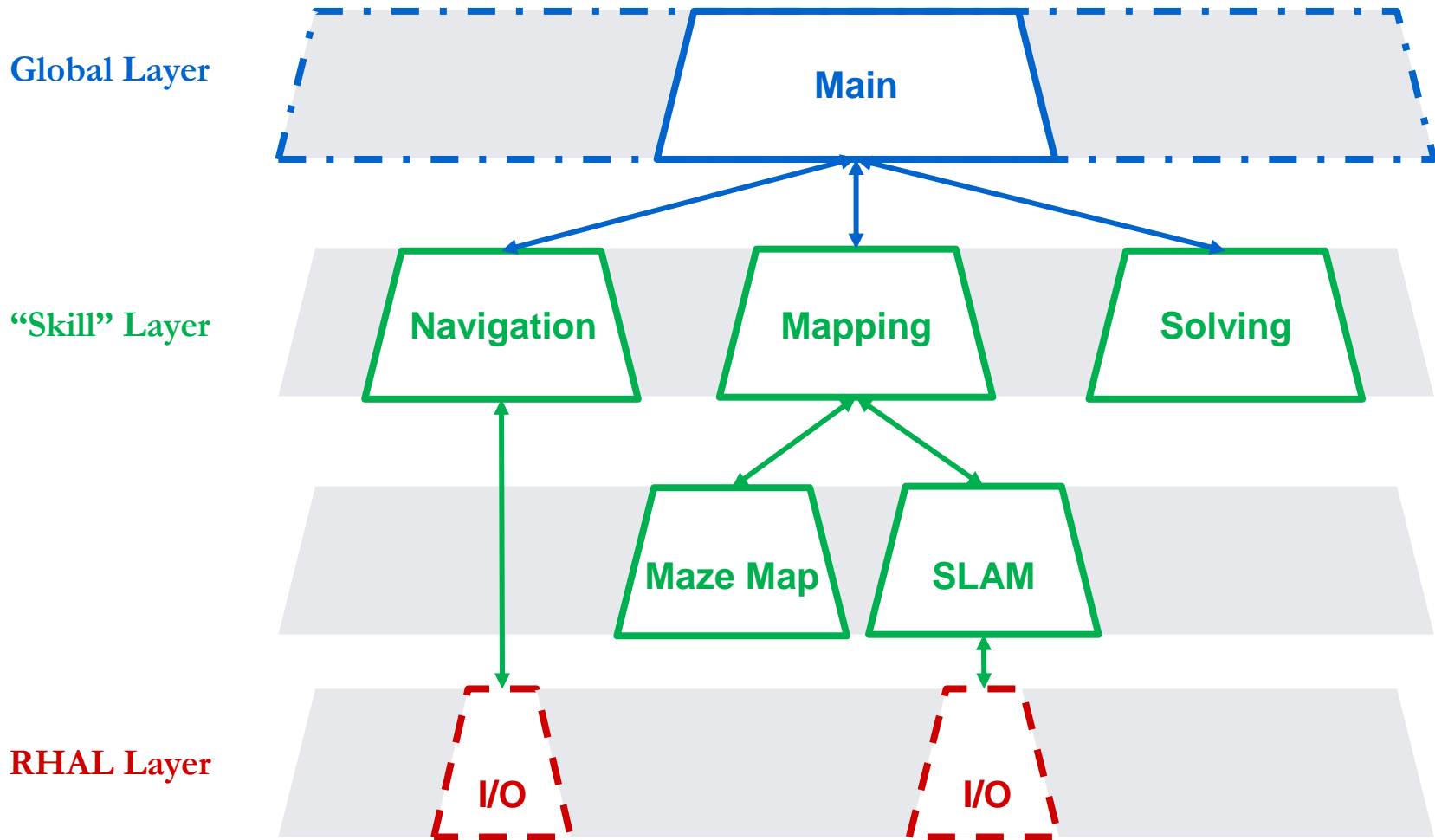


Task-Skill-Motion Framework

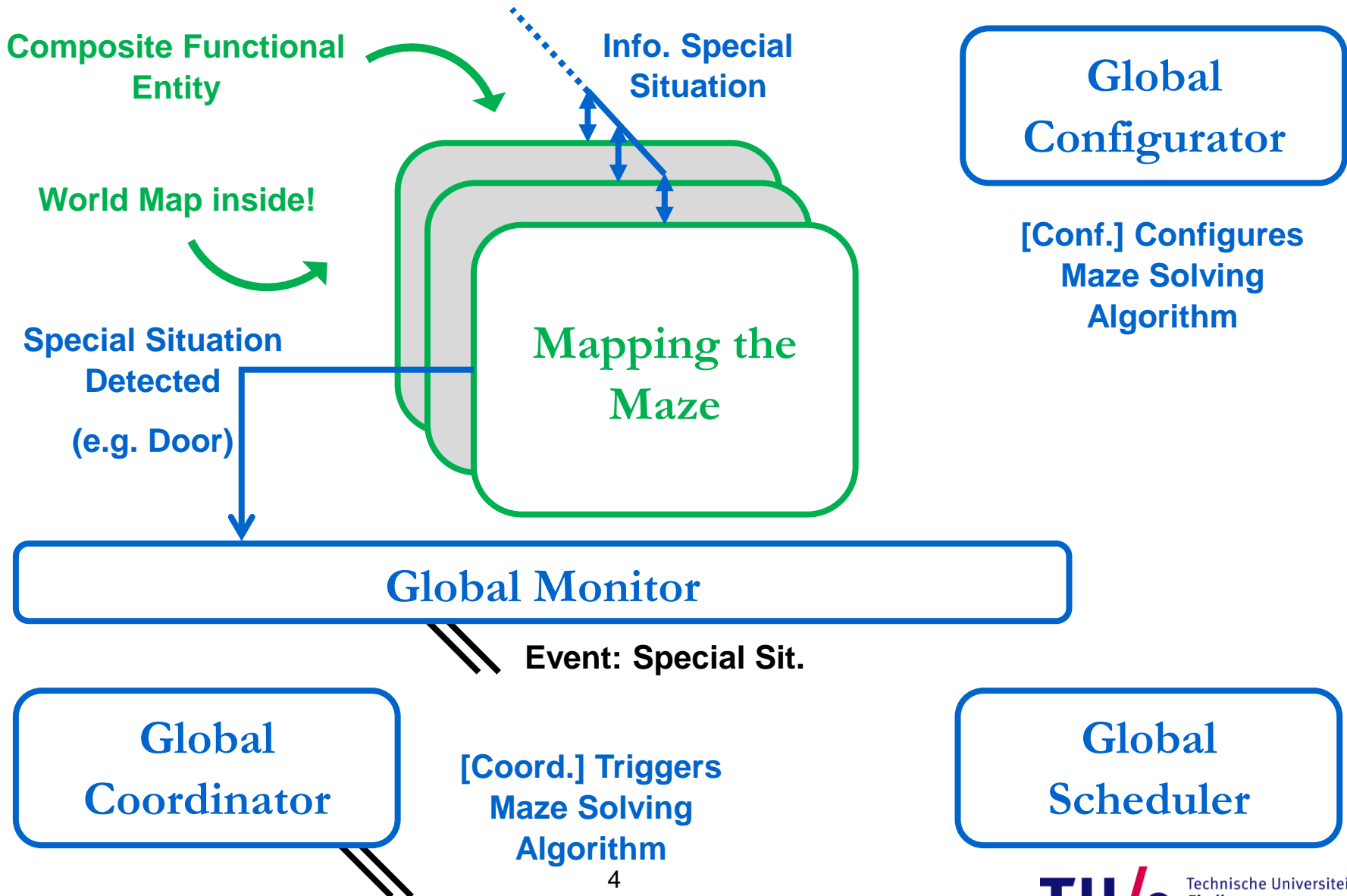
Task - Skill - Motion Framework



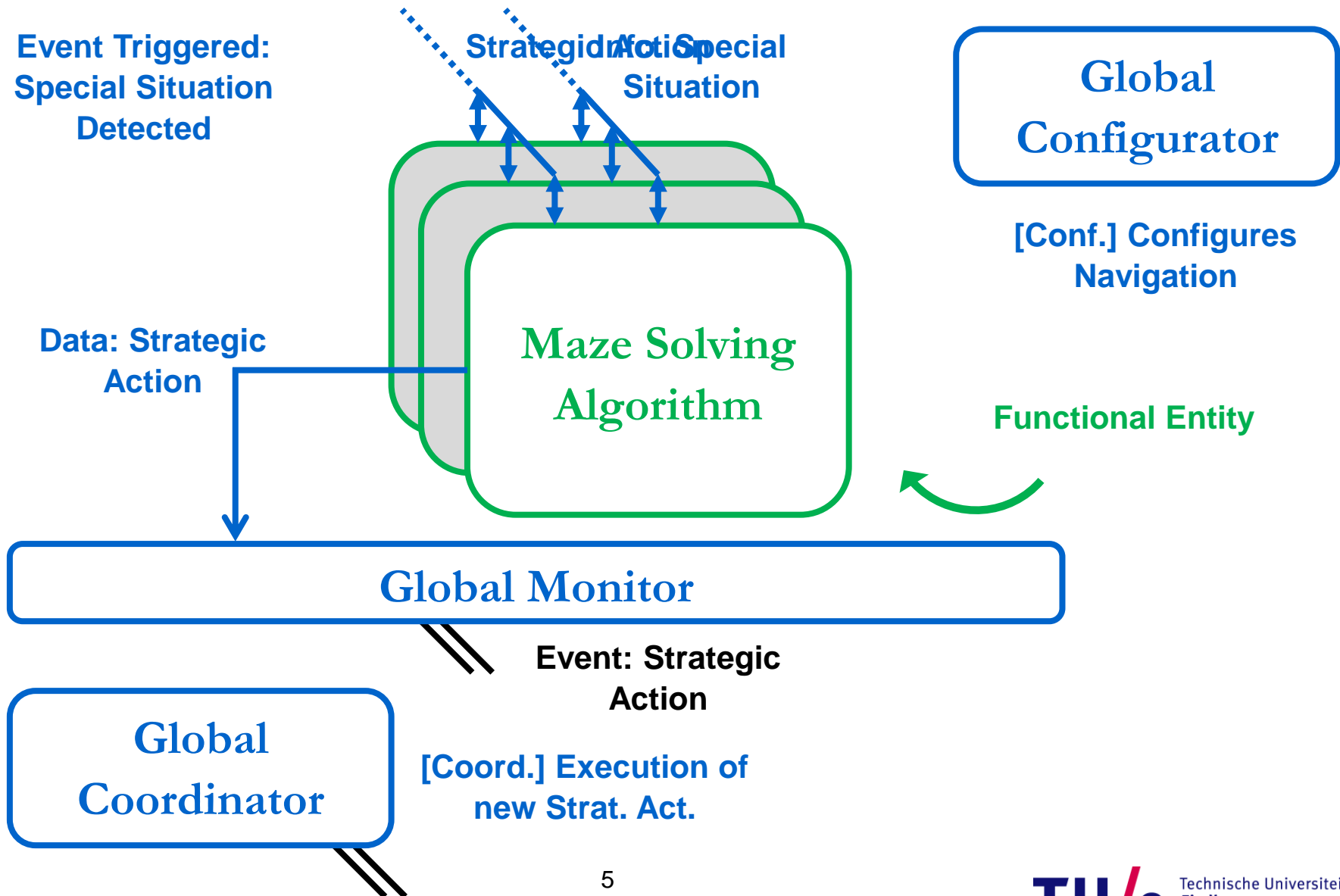
Composition Hierarchy



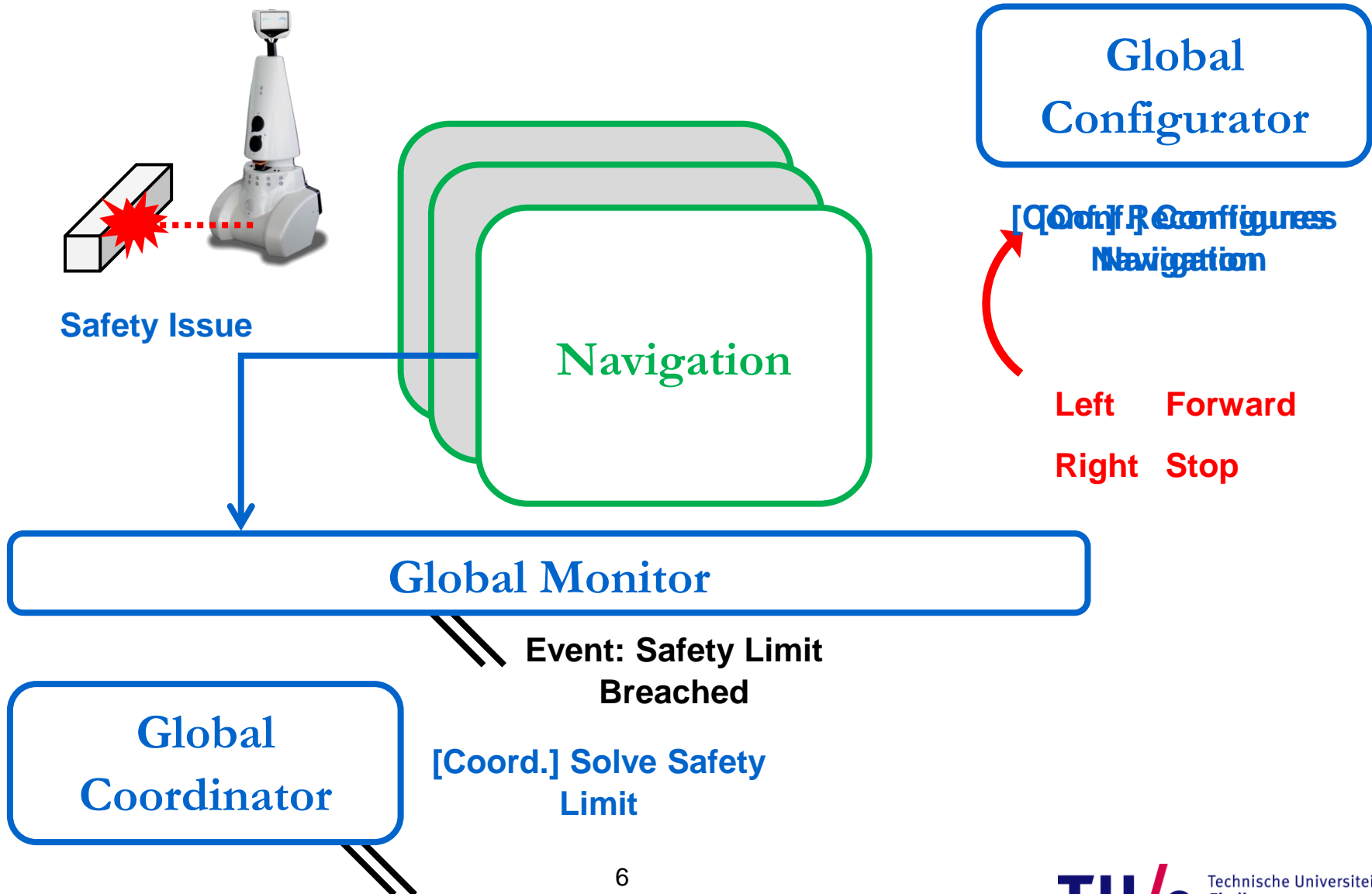
Composition Pattern - Global



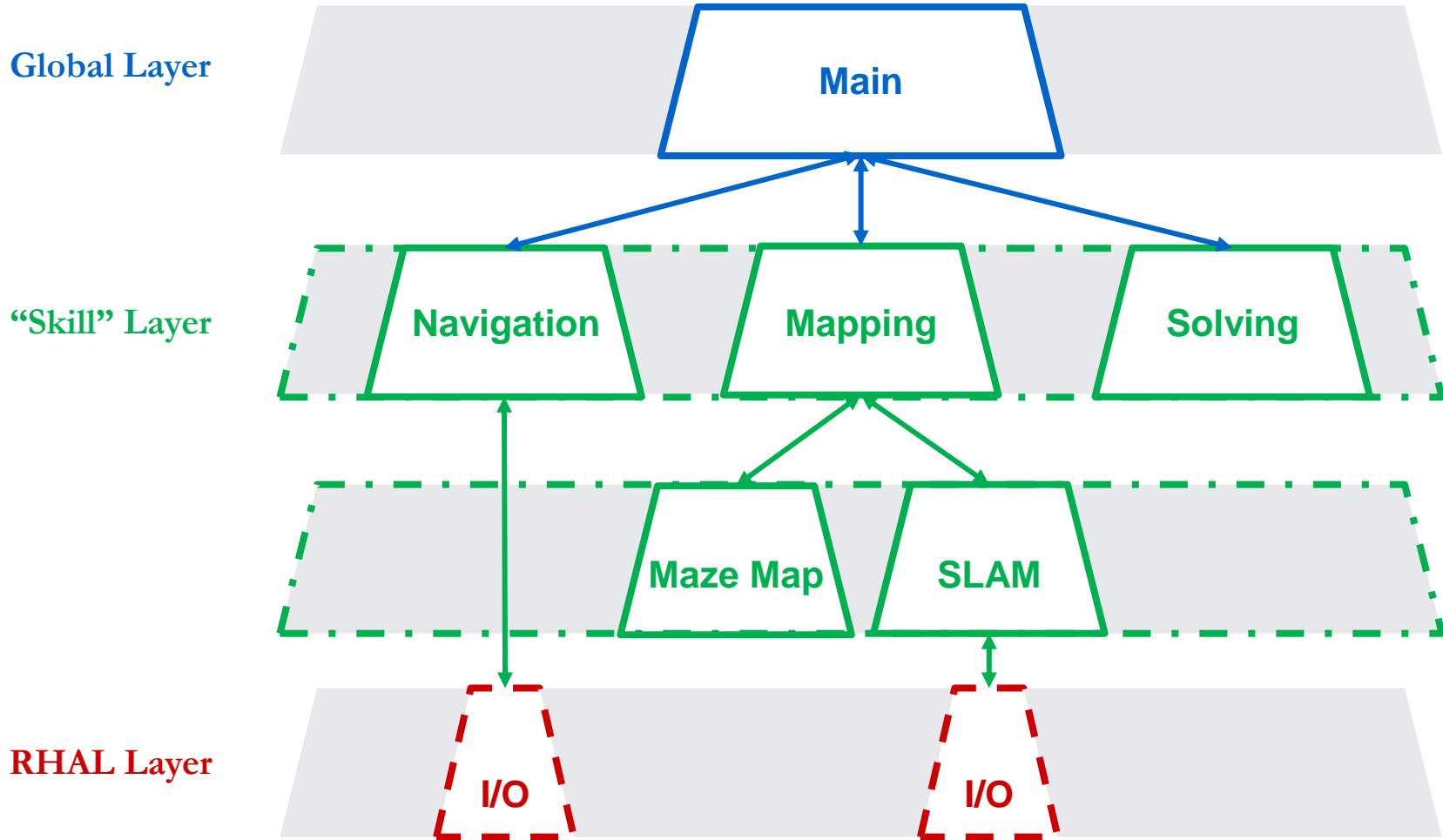
Composition Pattern - Global



Composition Pattern - Global



Composition Hierarchy



Composition Pattern: Navigation

▶ Functional Entities:

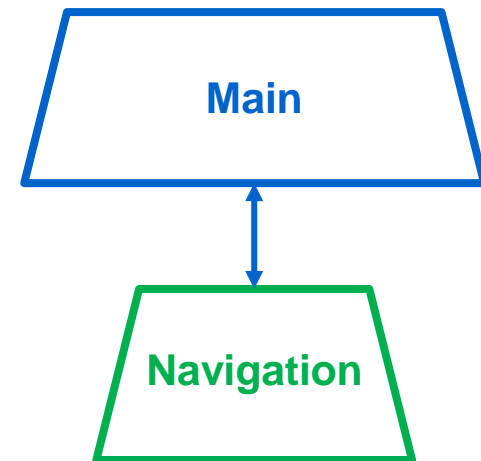
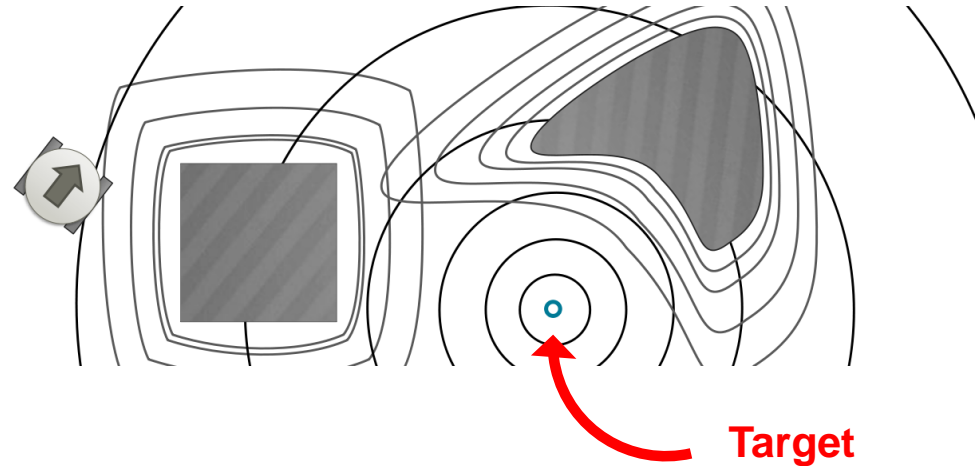
- *GetSensorData*
- *Potential Field Algorithm*
- *SendVelocities*
- *CheckValidityTarget*

▶ Coordinator:

- If target (Potential Field) has been reached, trigger new target.
- Receives Special Situation strategy

▶ Configurator:

- Configures *Potential Field Algorithm* for the new motion/target.



Composition Pattern: Mapping the maze

▶ Two Composition Patterns

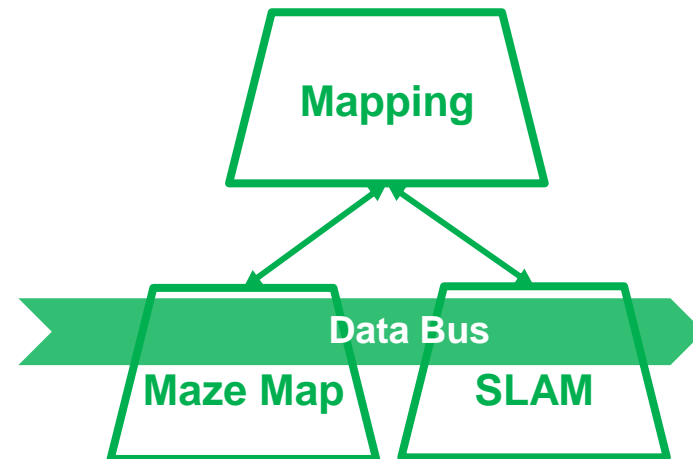
- SLAM Algorithm
- Maze Map

▶ SLAM Algorithm

- *GetSensorData*
- *ExtractFeatures*
- *DetectSpecialSituation*
- *GetRobotPosition*
- *DoorArea*

▶ Maze Map

- *CreateMap*
- *ModifyMap*
- *CheckMap* (for invalid information)



Deployment of Composition Pattern

- ▶ Composition Pattern is static through run time; no *Composer*.
- ▶ Implicit Scheduling; the order of execution of the Functional Entities is fixed.
 - Sense-Think-Act
- ▶ No *Scheduler*-entities.
- ▶ Fourth “CP”-Layer is not ours to compose/design.
- ▶ Serialized Implementation of Tasks
 - Order was already presented
 - No blocking calls
- ▶ Single-Thread (Loop) (10 Hz)
- ▶ Within *Navigation* great care will be taken to schedule/implement according:
 - `schedule-acts()`
 - `communicate()`
 - `schedule-prepares()`

Thank you for your attention!

- ▶ Questions?
- ▶ Remarks?
- ▶ Discussions?

Group #2:

