

MECHATRONIC SYSTEMS ENGINEERING

SEMESTER PROJECT

TEAM UNKNOWN

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Duty

Collecting the bales of straw and bringing them to a certain location using different type of vehicles autonomously

Server-Side Duty

- Server know about the field
- Server decide the need for the vehicle type change
- Server update the vehicle with bale's node coordinate

Vehicle Duty

- Vehicle decides the path
- Vehicle avoid obstacles

Used types of vehicles

- 1 Small vehicle
- 1 Medium vehicle
- 1 Large vehicle
- 1 Weed Vehicle



CONSENS

Environment analysis

Active structure

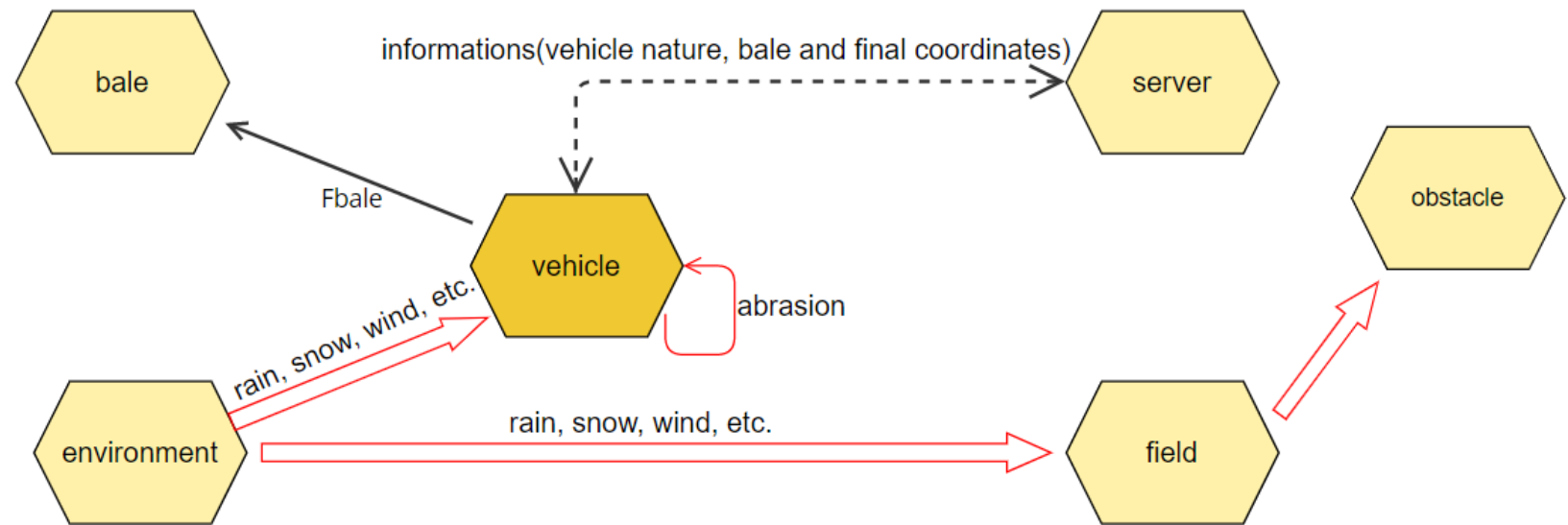
Requirements

Hierarchy of functions

Application scenarios

Behaviour definition

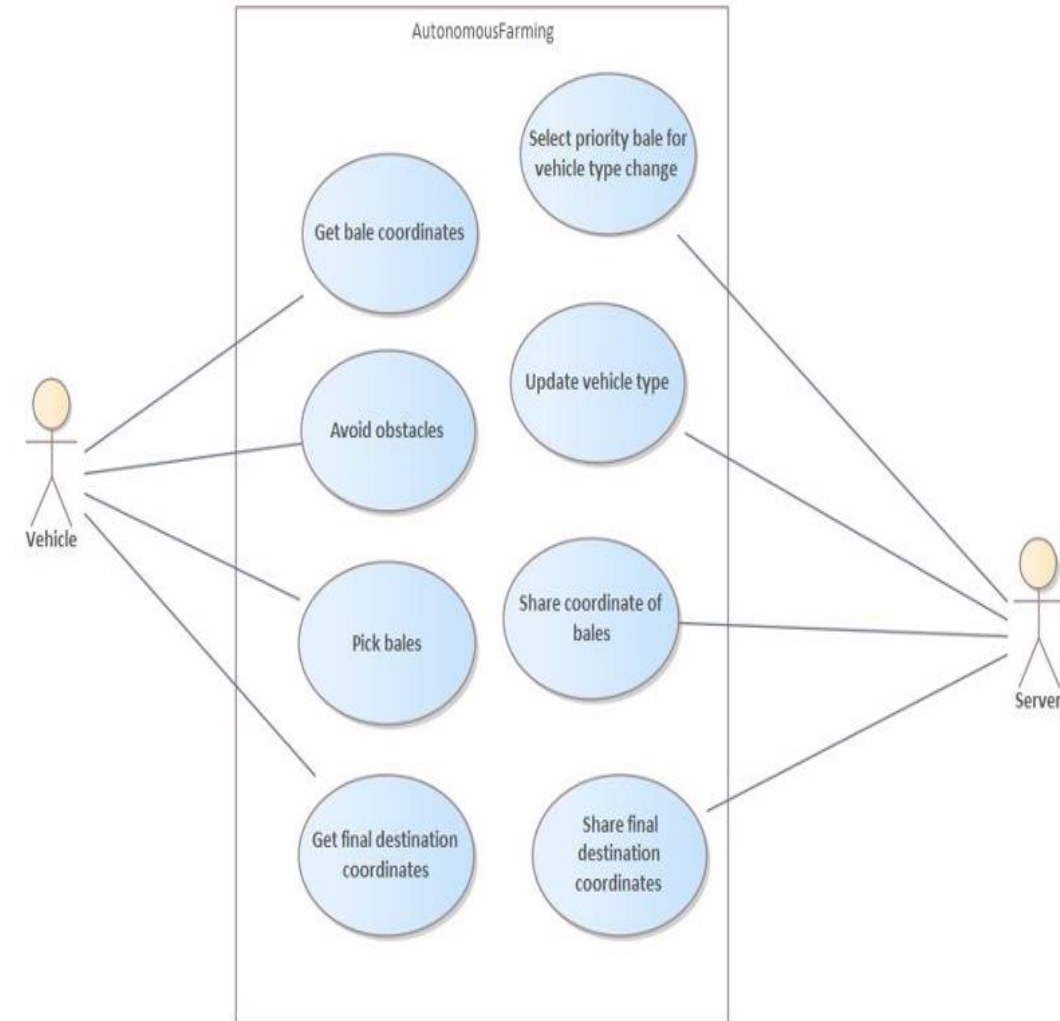
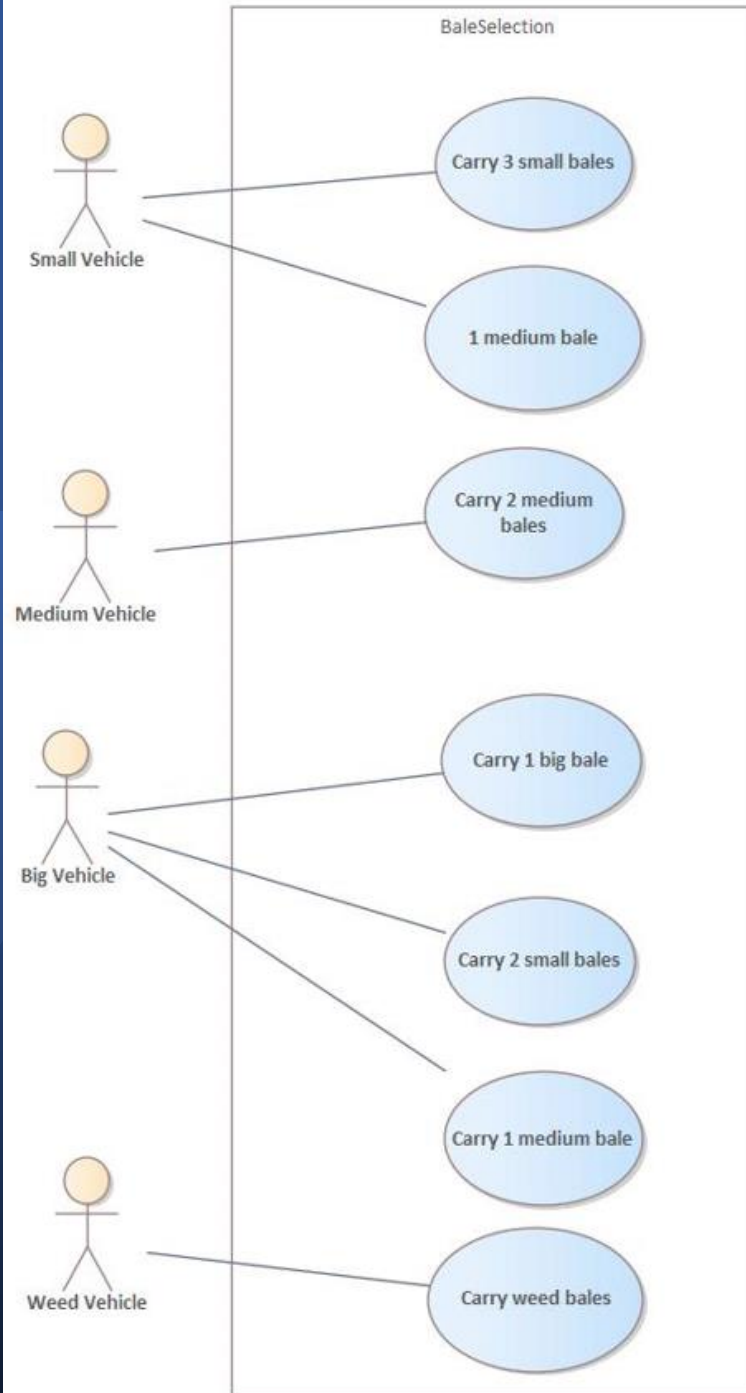
Environment Analysis



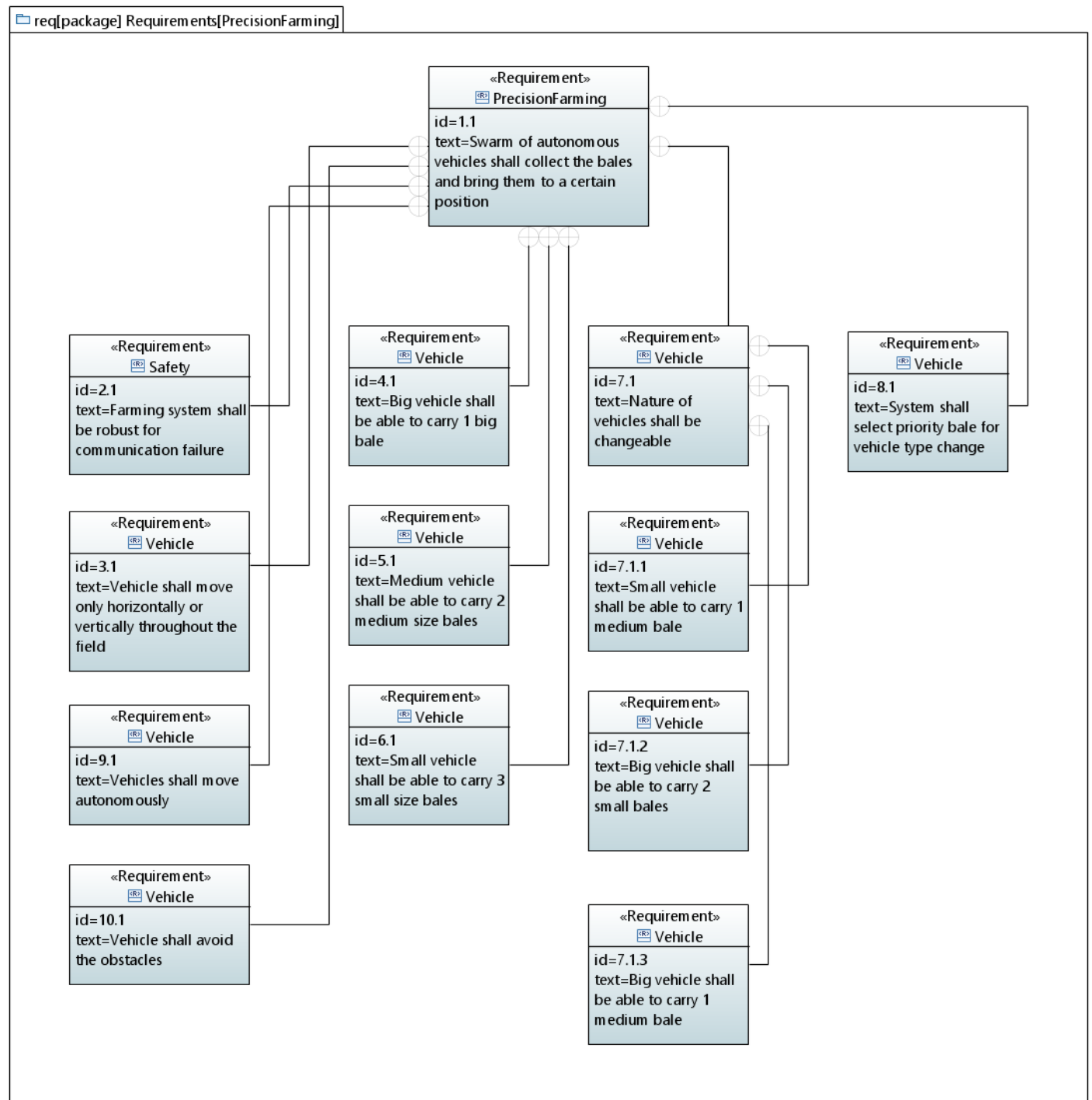


Active Structure

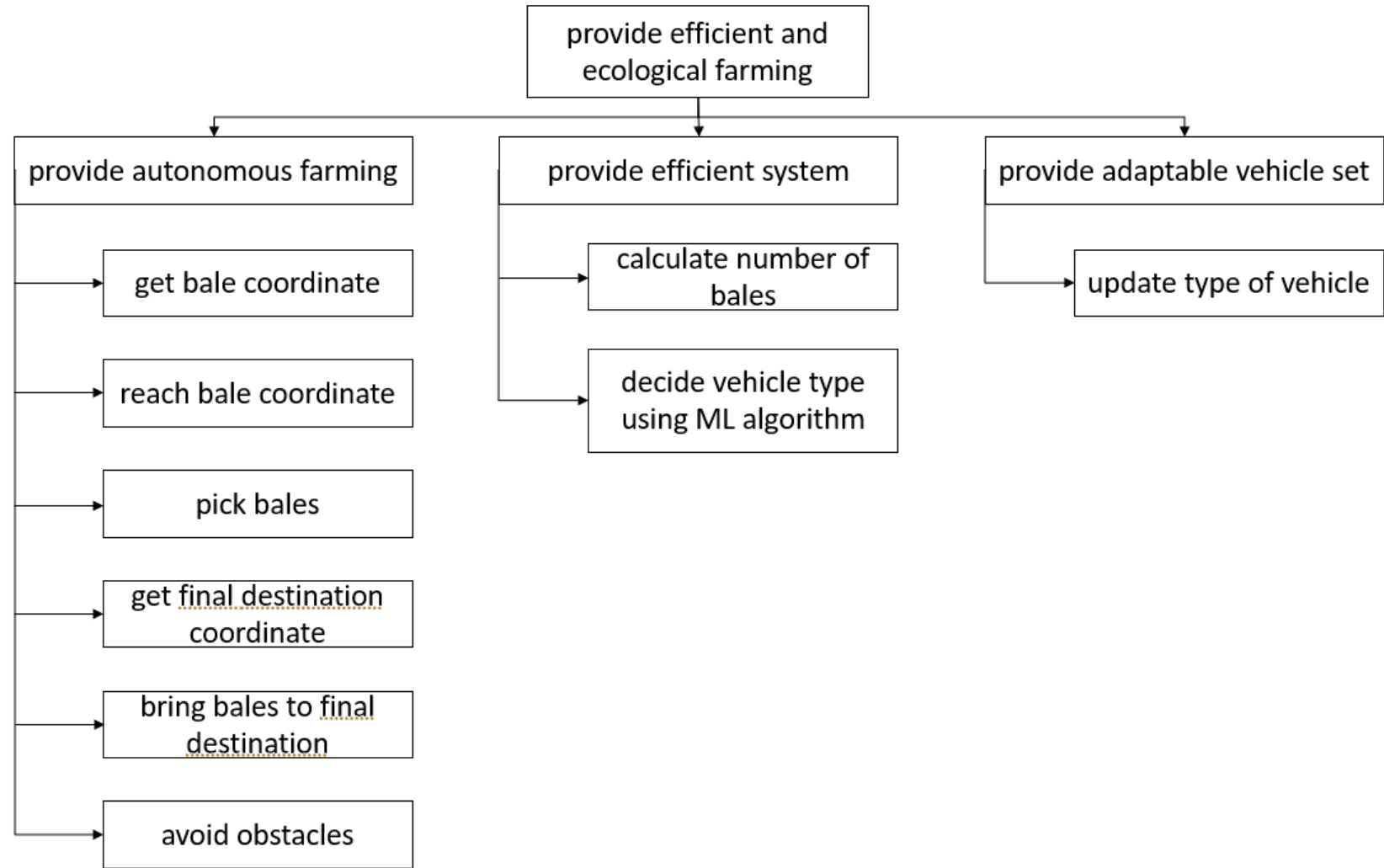
Application Scenarios



Requirements

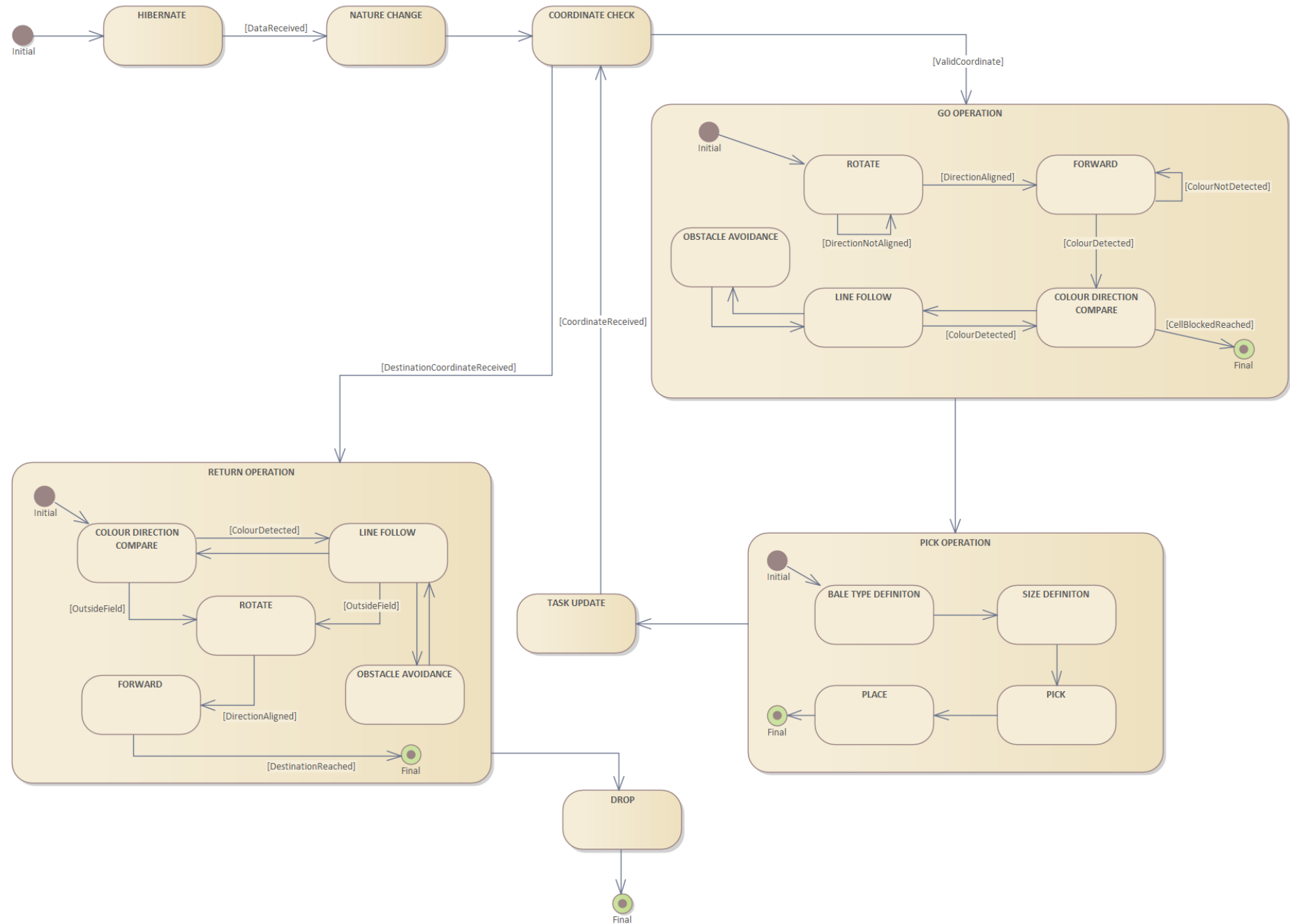


Hierarchy of Functions



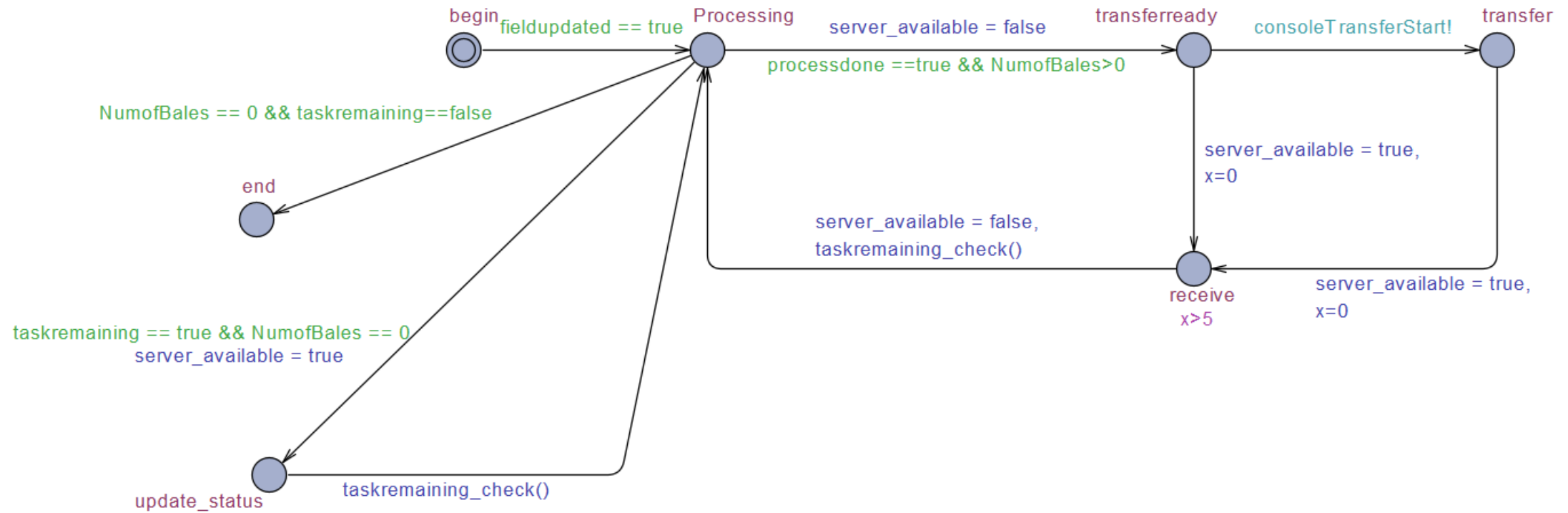
Behaviour Definition

stm mechatronics_behaviourdefinition



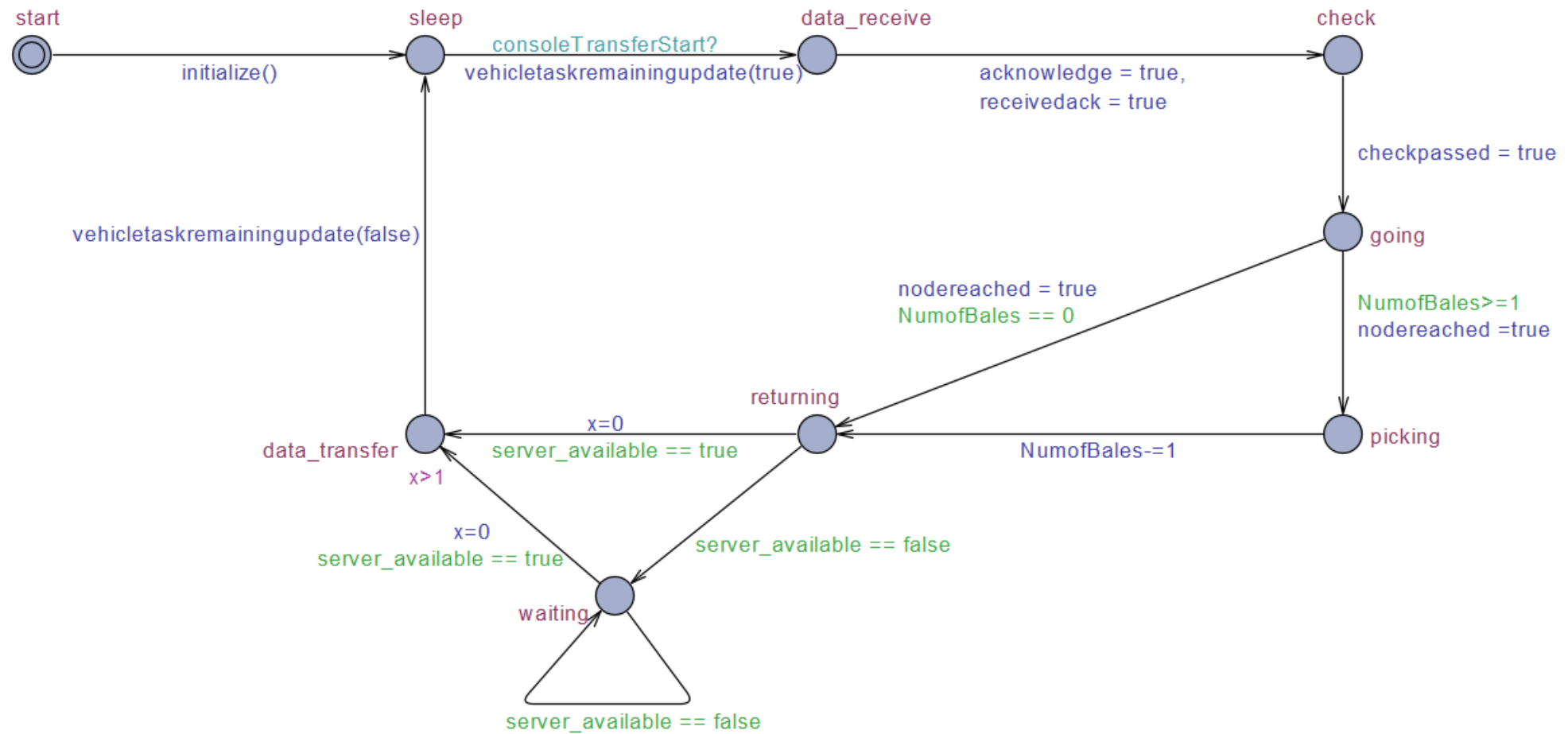
UPPAAL

Server Model

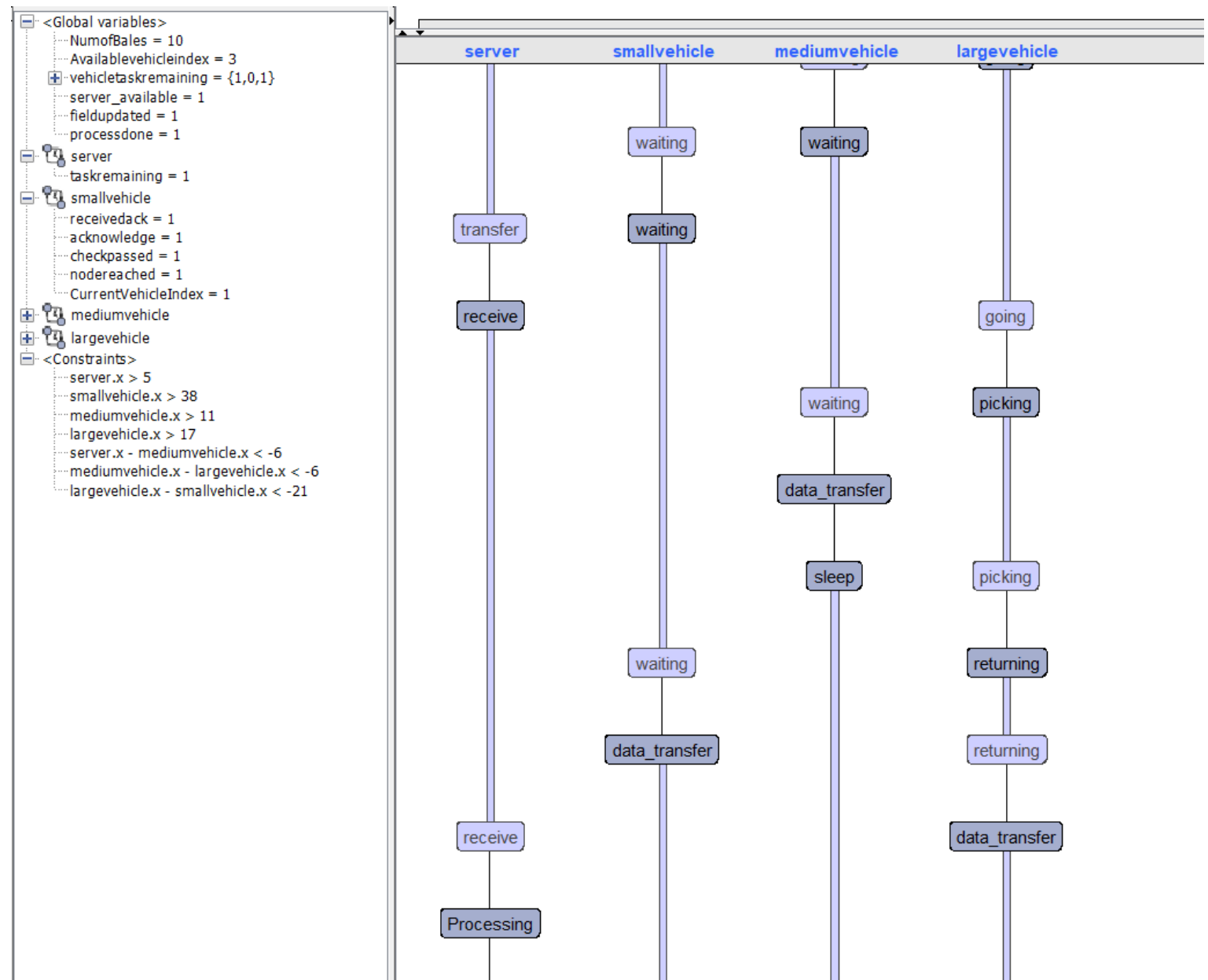


UPPAAL

Vehicle Model



UPPAAL



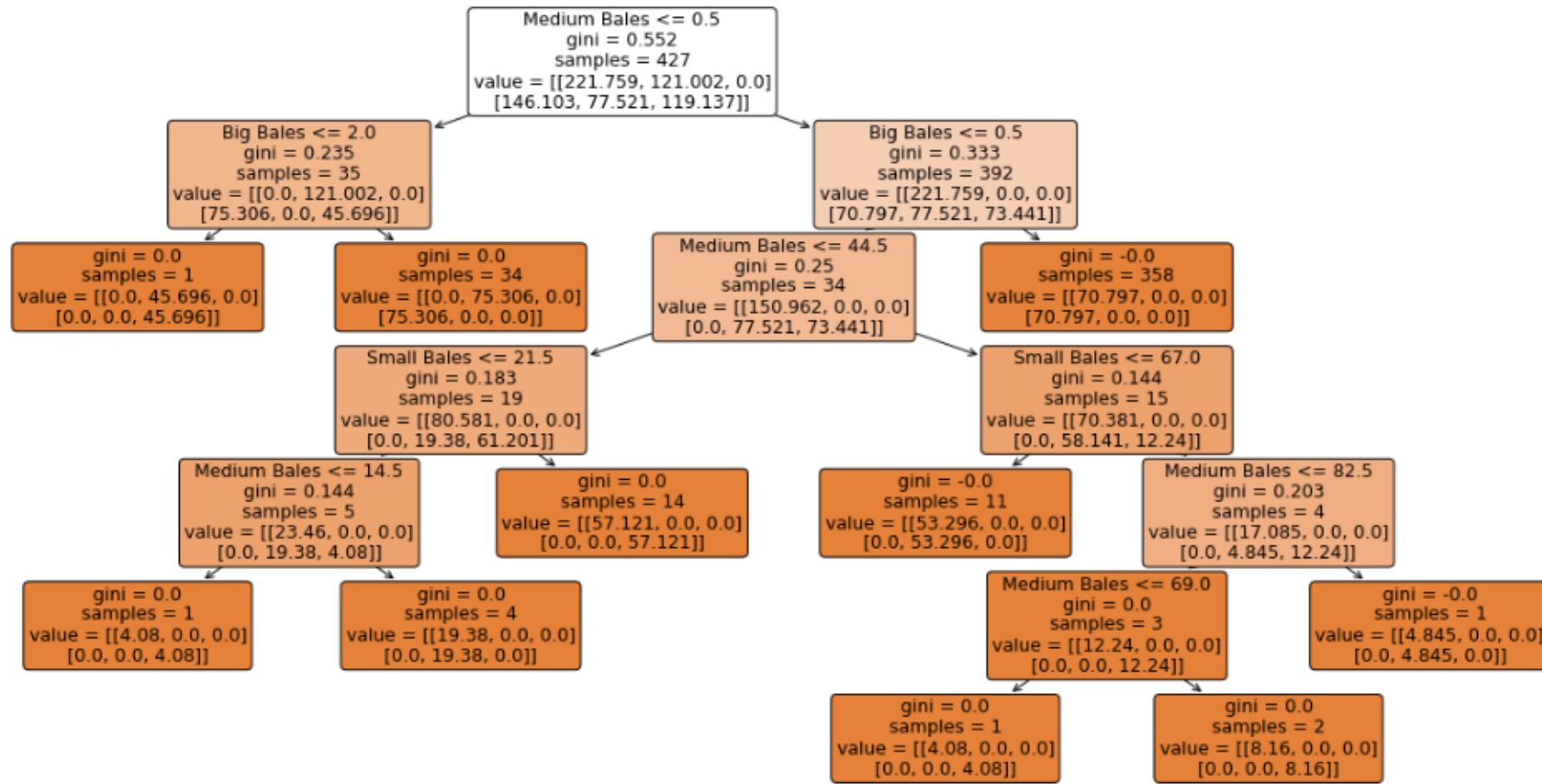
UPPAAL

Verification

- A[] not deadlock

Implementation of ML Algorithm

Implementation of ML Algorithm



Implementation of ML Algorithm



References

[1] Gausemeier (2014), *Design Methodology for Intelligent Technical Systems ,Develop Intelligent Technical Systems of the Future.*

[2] J.Gausemeier , U.Frank , J.Donoth,S.Kahl, (2009), *Specification technique for the description of selfoptimizing mechatronic systems*

A photograph of a field filled with large, round hay bales. The bales are golden-brown and arranged in a line that recedes into the distance. The sky is a deep blue with scattered white clouds. The entire image is framed by a thin white border.

THANK YOU!