Customizing Papyrus-RT to Facilitate Model-Driven Development of Rover Software

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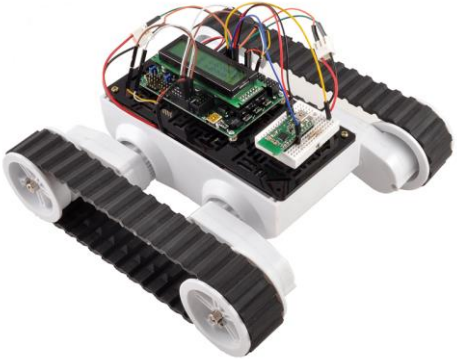
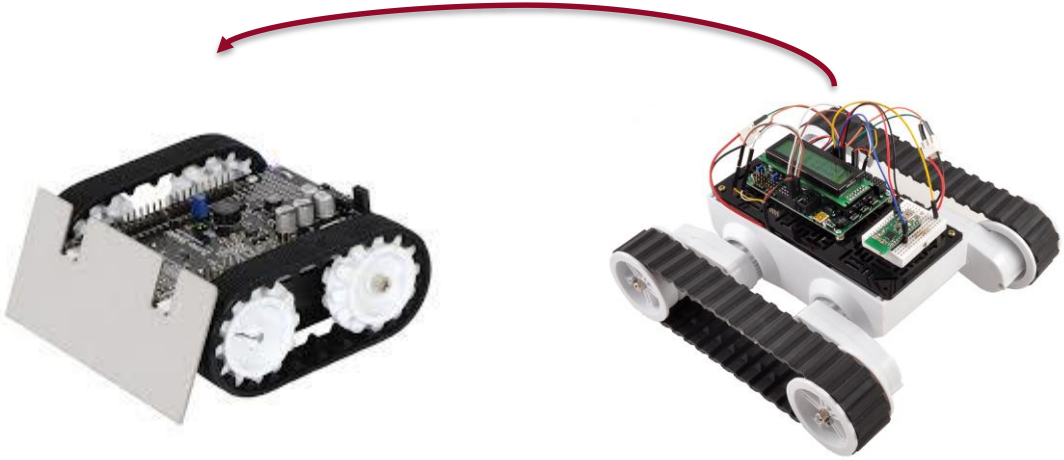
Rover !!

Rover !!



Rover A

Rover !!

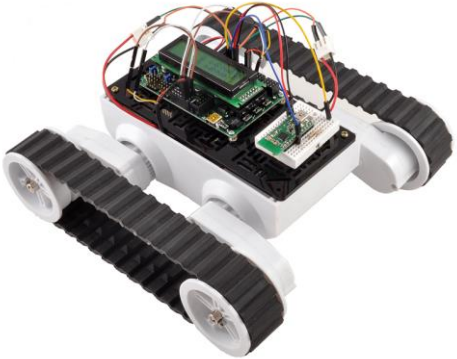


Rover B

Rover A

Rover !!

Rover B

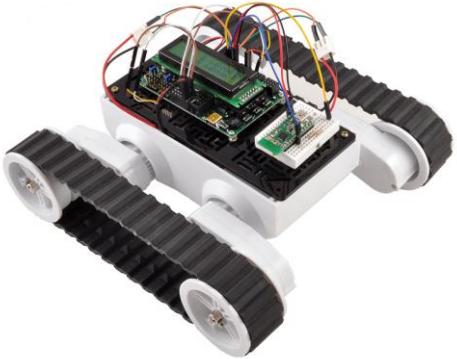


Rover A

Rover C

Rover !!

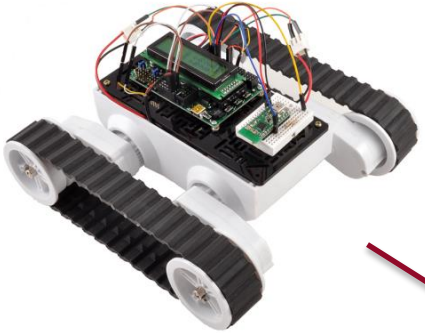
Rover B



Rover A

Rover C

Common Factor ??



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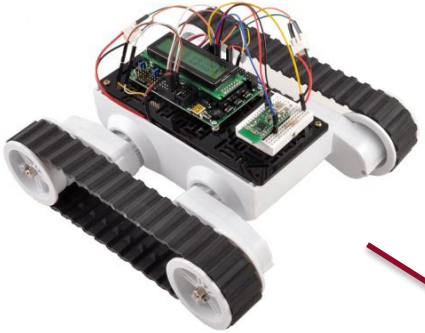
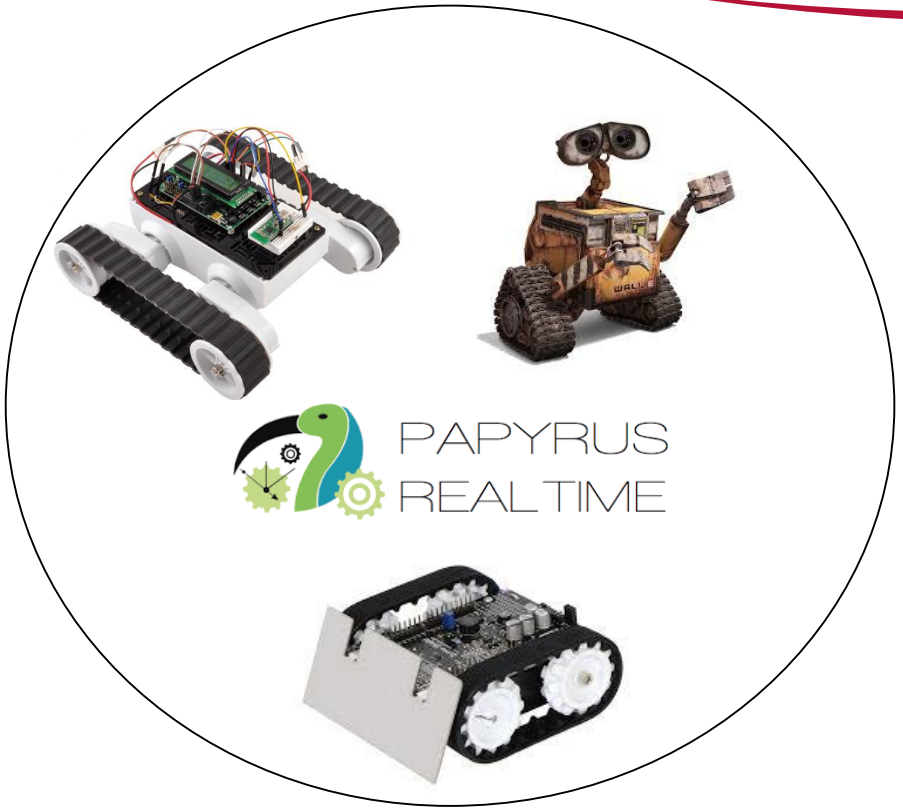
Common Factor - Papyrus-RT

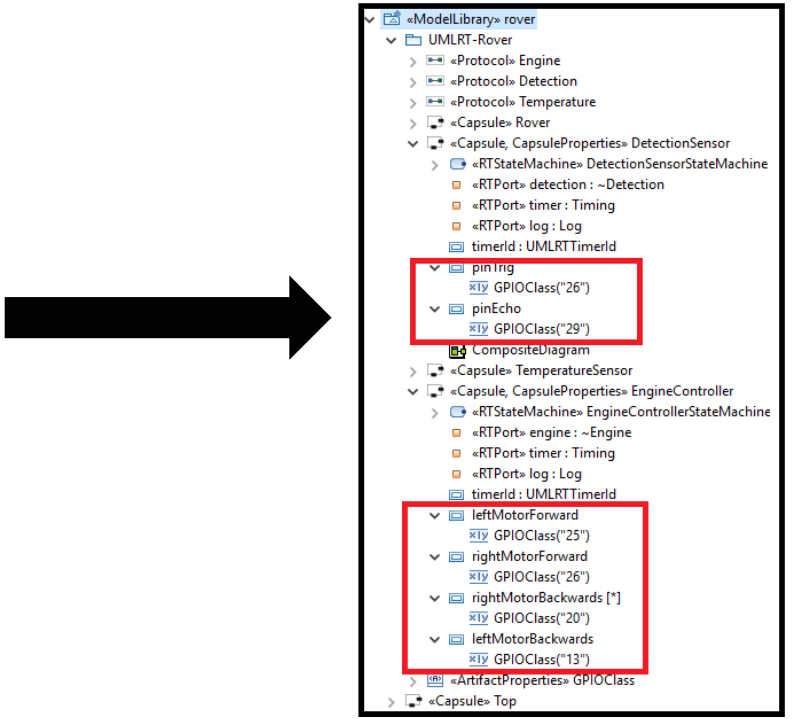


PAPYRUS REAL TIME

Modelling Using Papyrus-RT



Modelling Using Papyrus-RT



Problem Statement

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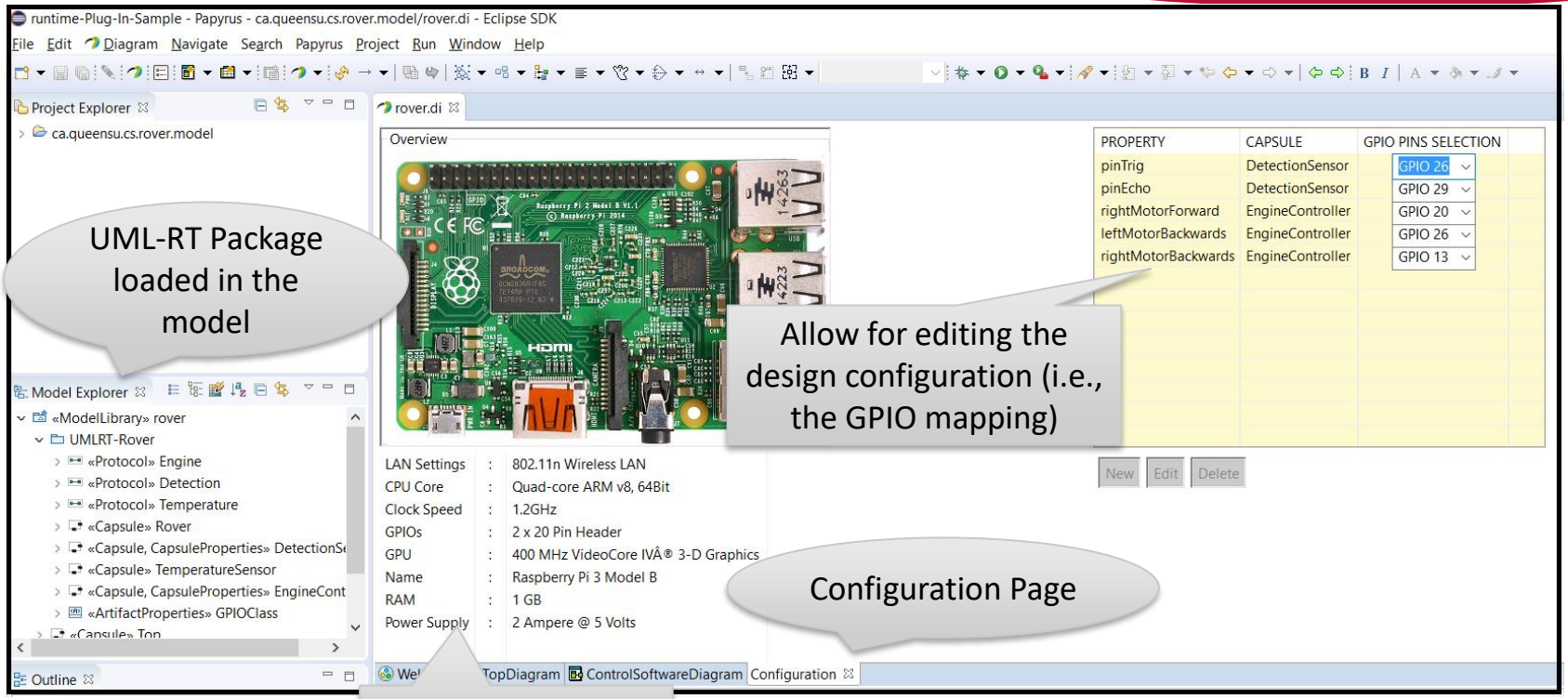
How to change the design configuration without having to modify the Rover Library ?

Motivation ⟷ Solution

- Embedding a specific configuration page with the loaded library
- Providing a unique user experience when designing the Rover Model

Current Implementation



The Change!!

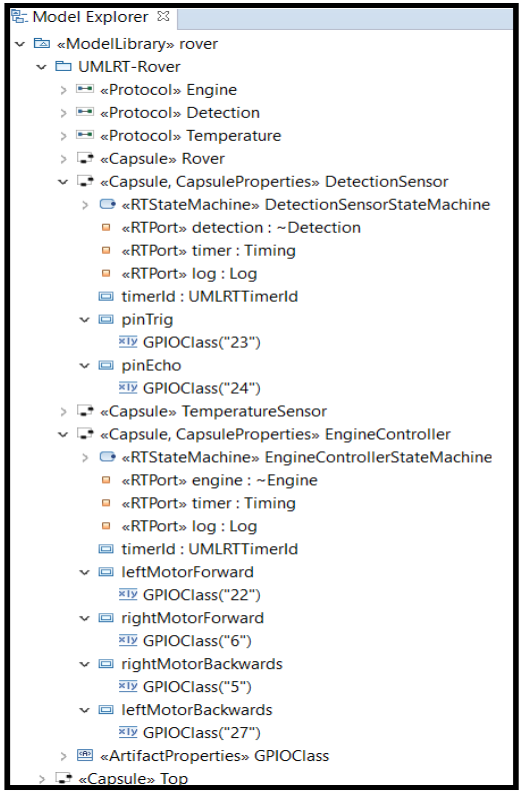
Before

Model Explorer

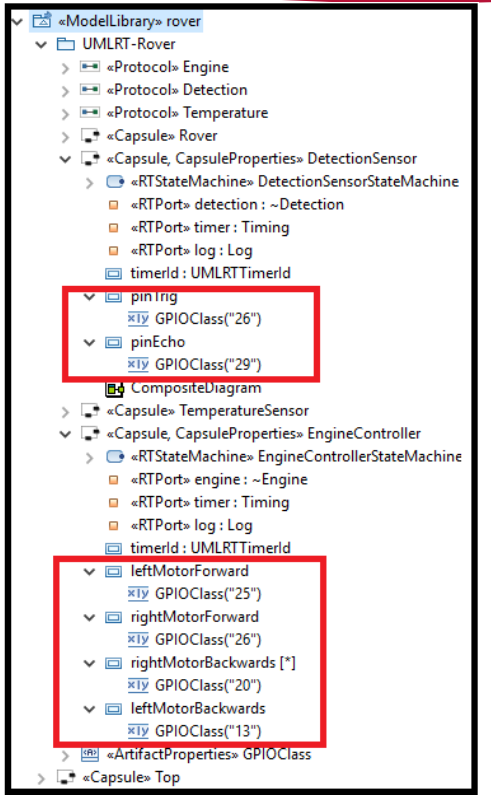
- «ModelLibrary» rover
  - UMLRT-Rover
    - «Protocol» Engine
    - «Protocol» Detection
    - «Protocol» Temperature
    - «Capsule» Rover
    - «Capsule, CapsuleProperties» DetectionSensor
      - «RTStateMachine» DetectionSensorStateMachine
      - «RTPort» detection : ~Detection
      - «RTPort» timer : Timing
      - «RTPort» log : Log
      - timerId : UMLRTTimerId
      - pinTrig
        - GPIOClass("23")
      - pinEcho
        - GPIOClass("24")
    - «Capsule» TemperatureSensor
    - «Capsule, CapsuleProperties» EngineController
      - «RTStateMachine» EngineControllerStateMachine
      - «RTPort» engine : ~Engine
      - «RTPort» timer : Timing
      - «RTPort» log : Log
      - timerId : UMLRTTimerId
      - leftMotorForward
        - GPIOClass("22")
      - rightMotorForward
        - GPIOClass("6")
      - rightMotorBackwards
        - GPIOClass("5")
      - leftMotorBackwards
        - GPIOClass("27")
    - «ArtifactProperties» GPIOClass
    - «Capsule» Top

The Change!!

Before



After



Future Work

- Analysing hardware specification of various Rovers to further enhance the overall user experience in the context of MDD of Rover Software
- Dynamically creating & disposing new tabs within the configuration page depending on the loaded package
- Defining a software product line for Rovers

Thank You !!