Introduction to Systems Engineering

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DAY 1 Demo

SysML Models for an ABS (Antilock Brake System)

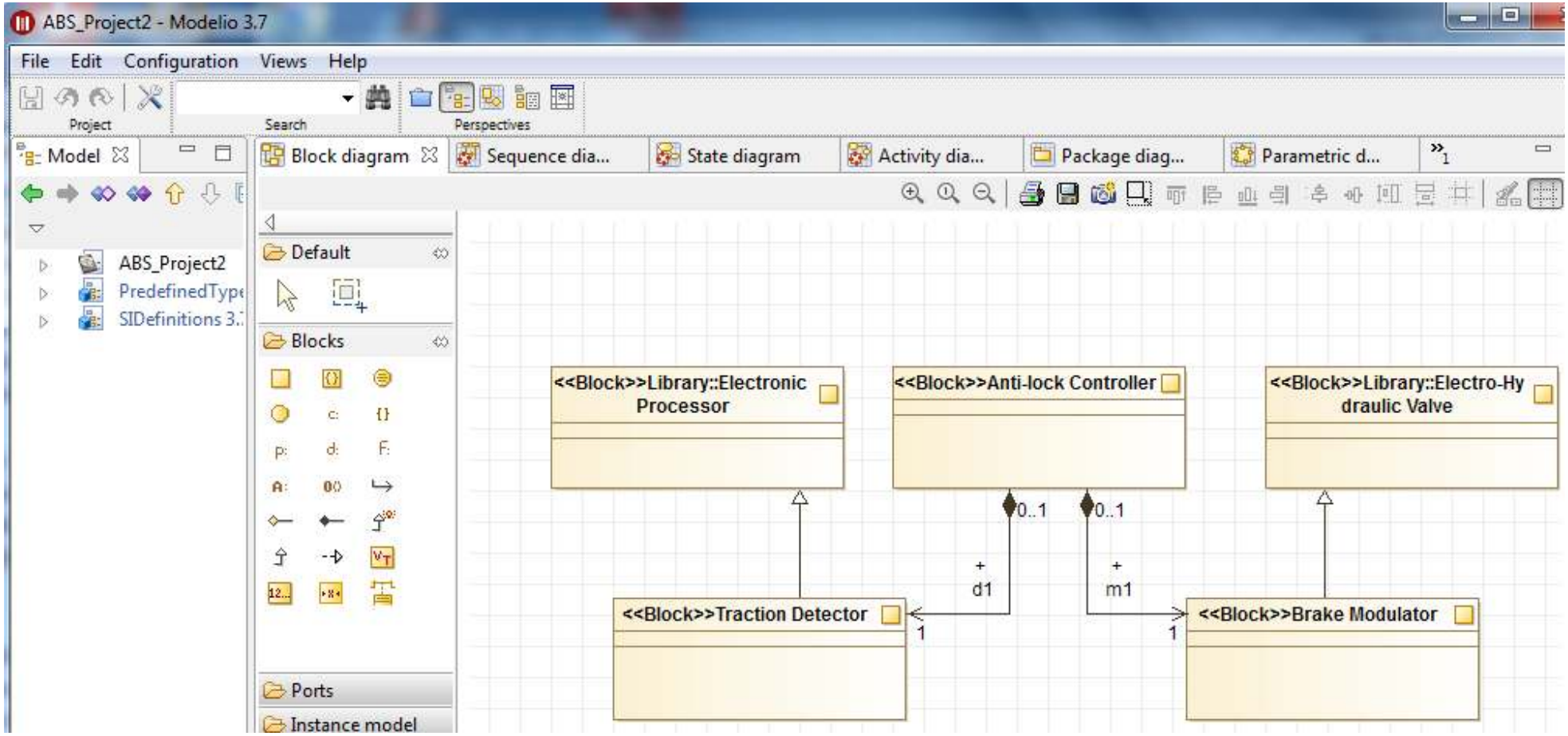
- We will demonstrate several models for a typical ABS design.
- Models will include:
  - Structure
  - Behavior
  - Requirements
  - Parametrics

TOOL

- The open source product Modelio will be the SysML tool used in the course.

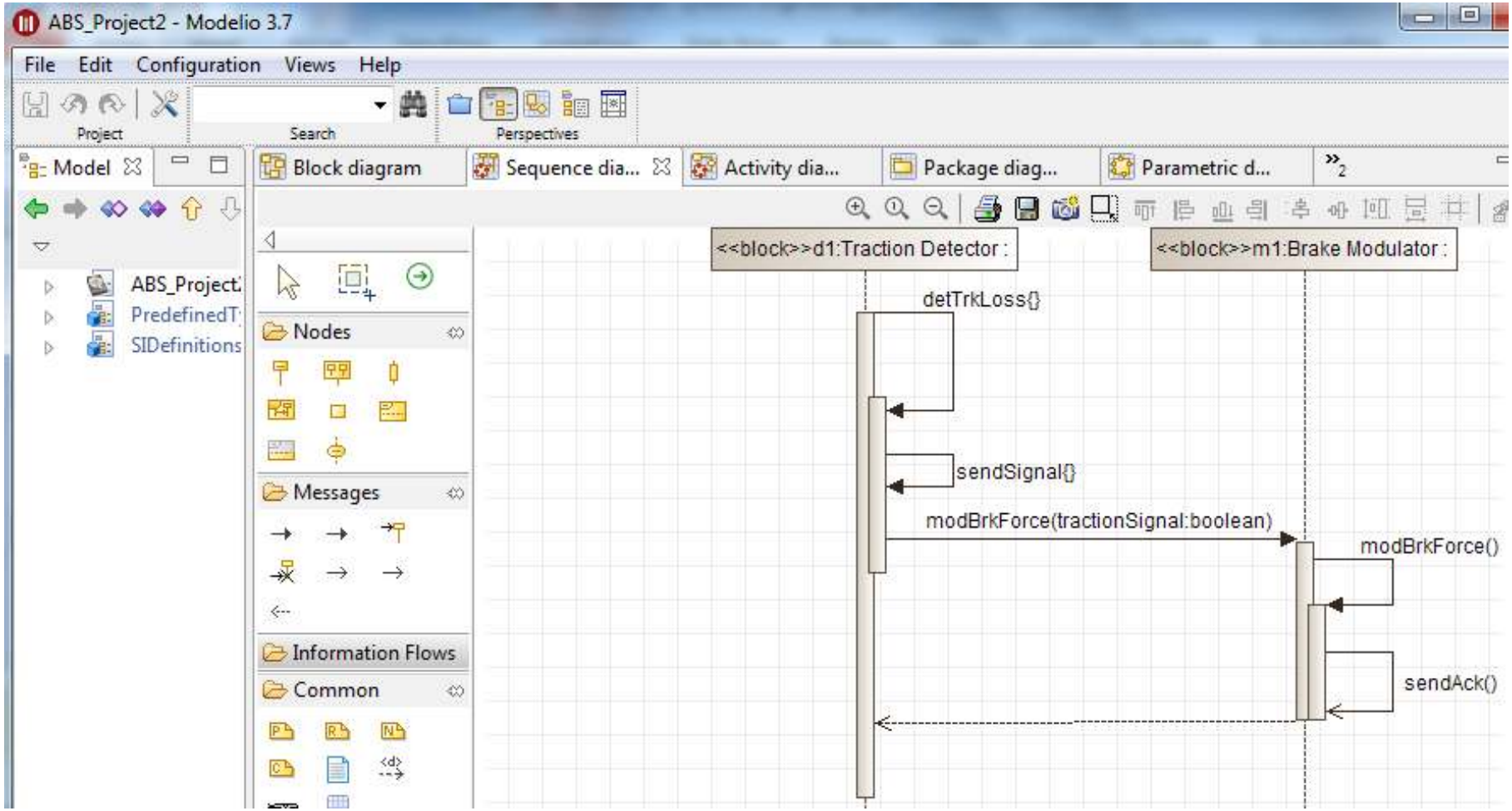
DAY 1 Demo

SysML Models for an ABS (Antilock Brake System): Block Diagram



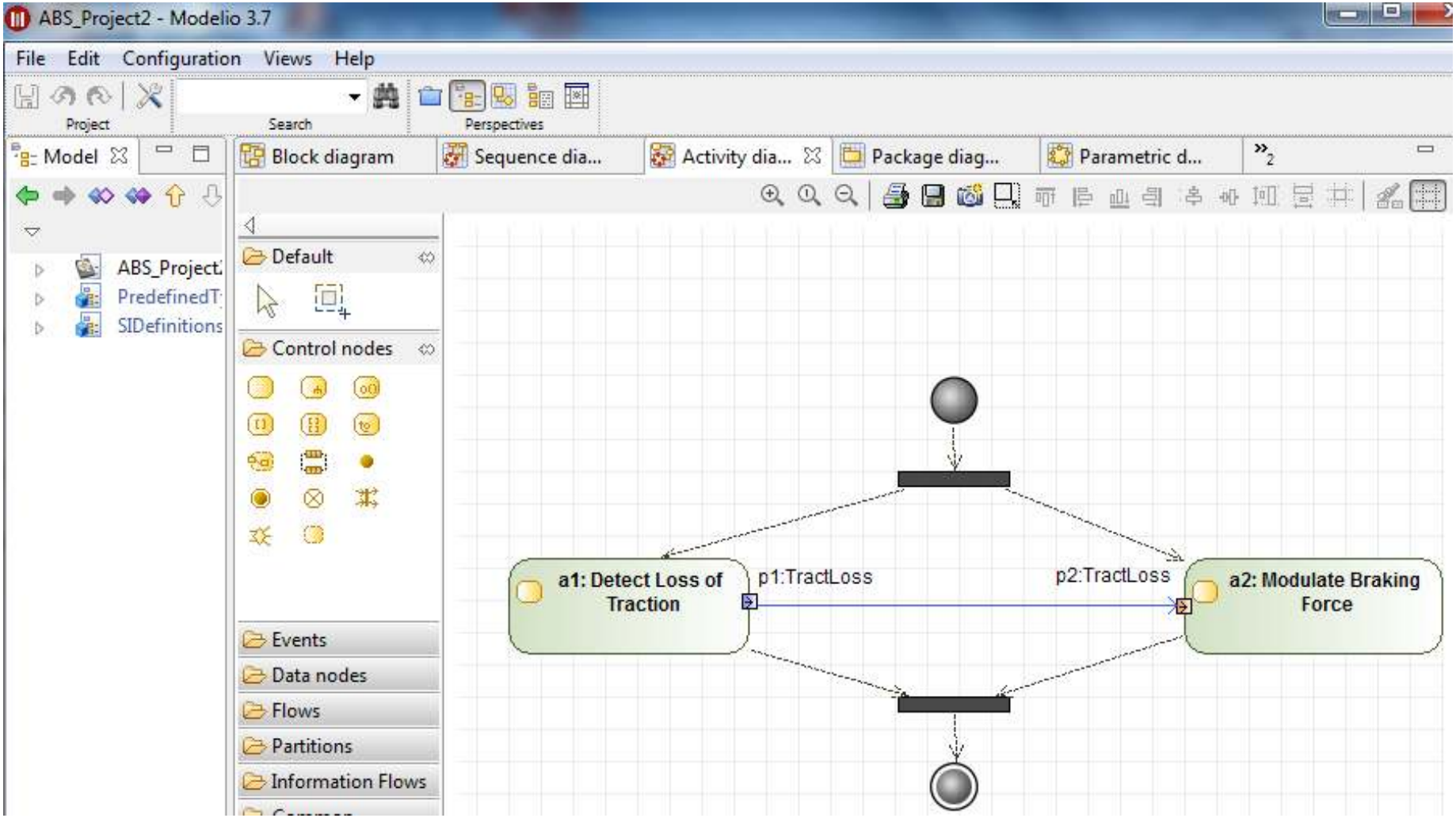
DAY 1 Demo

SysML Models for an ABS (Antilock Brake System): Sequence Diagram



DAY 1 Demo

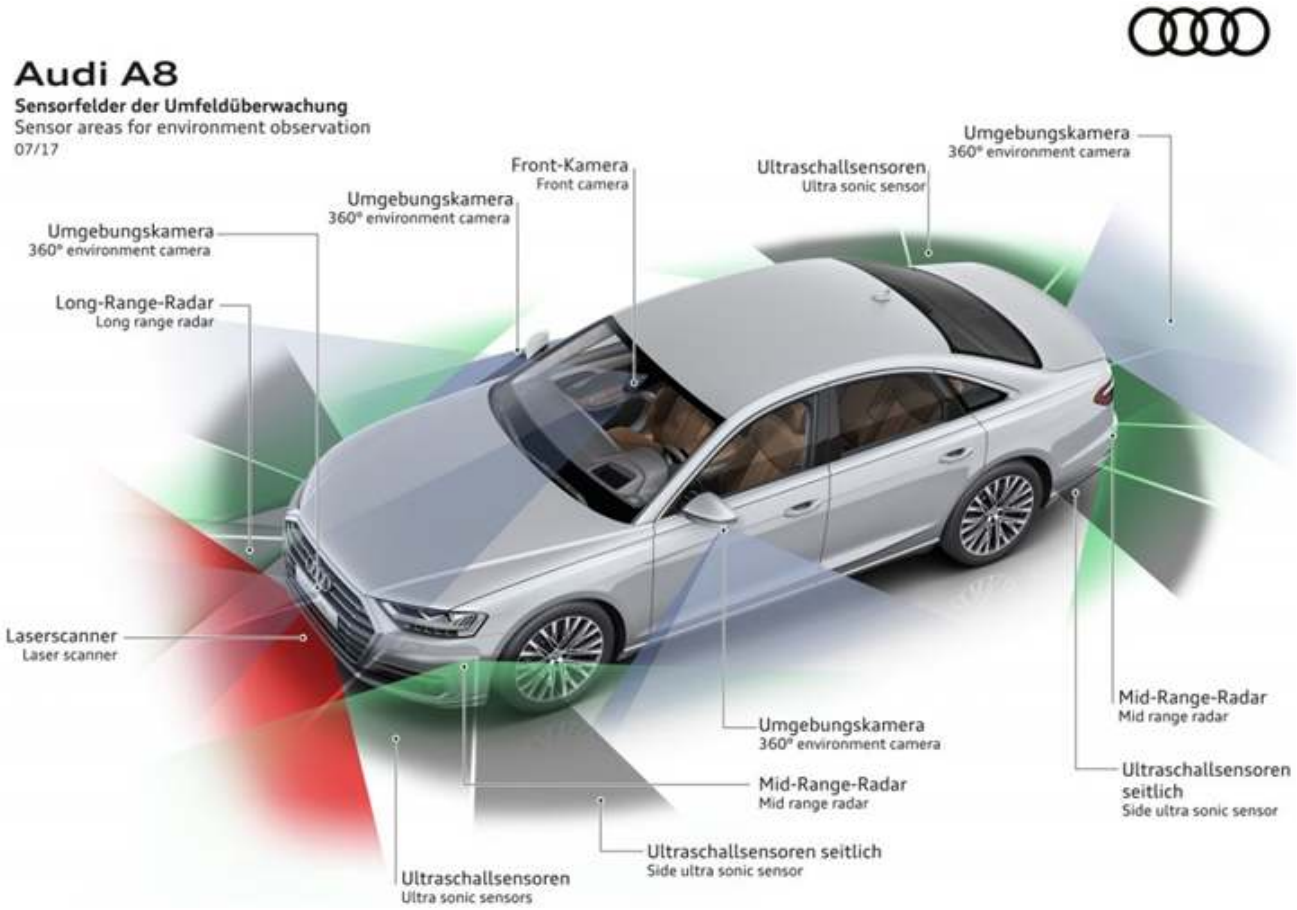
SysML Models for an ABS (Antilock Brake System): Activity Diagram



DAY 1 Exercises

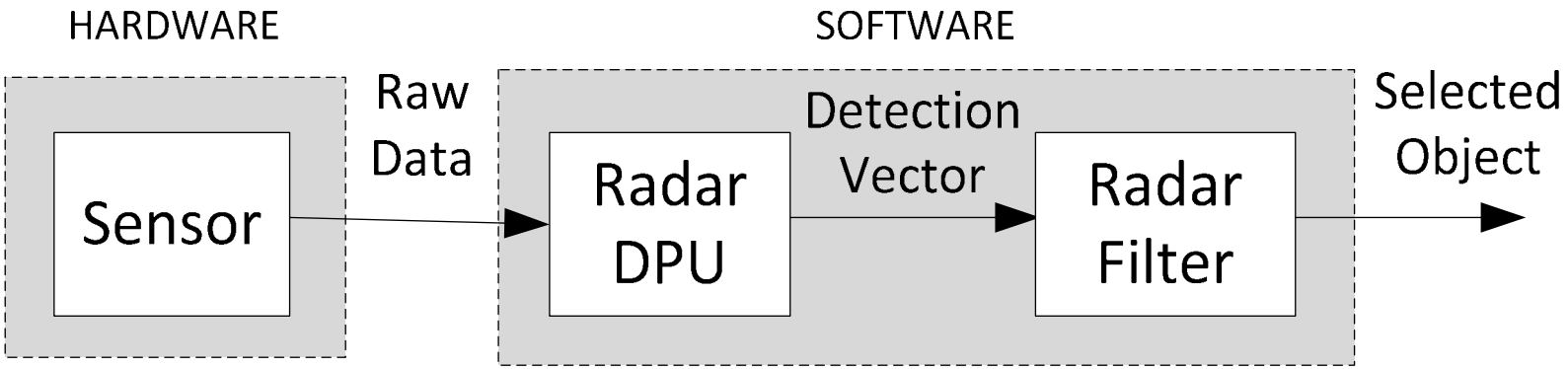
- **Exercise # 1:**

▶ List and summarize the functionalities of the AV perception system of a well known commercial vehicle (Audi A8) featuring ADAS & Autonomous Driving technologies.



DAY 1 Exercises

- **Exercise # 2**:
- List a set of requirements and specify the structure, behavior, and parametrics of the Radar Sub-system component of the AV perception system of exercise 1 in a manual fashion (i.e., not using a specialized tool).



DAY 1 Workshop

WORKSHOP

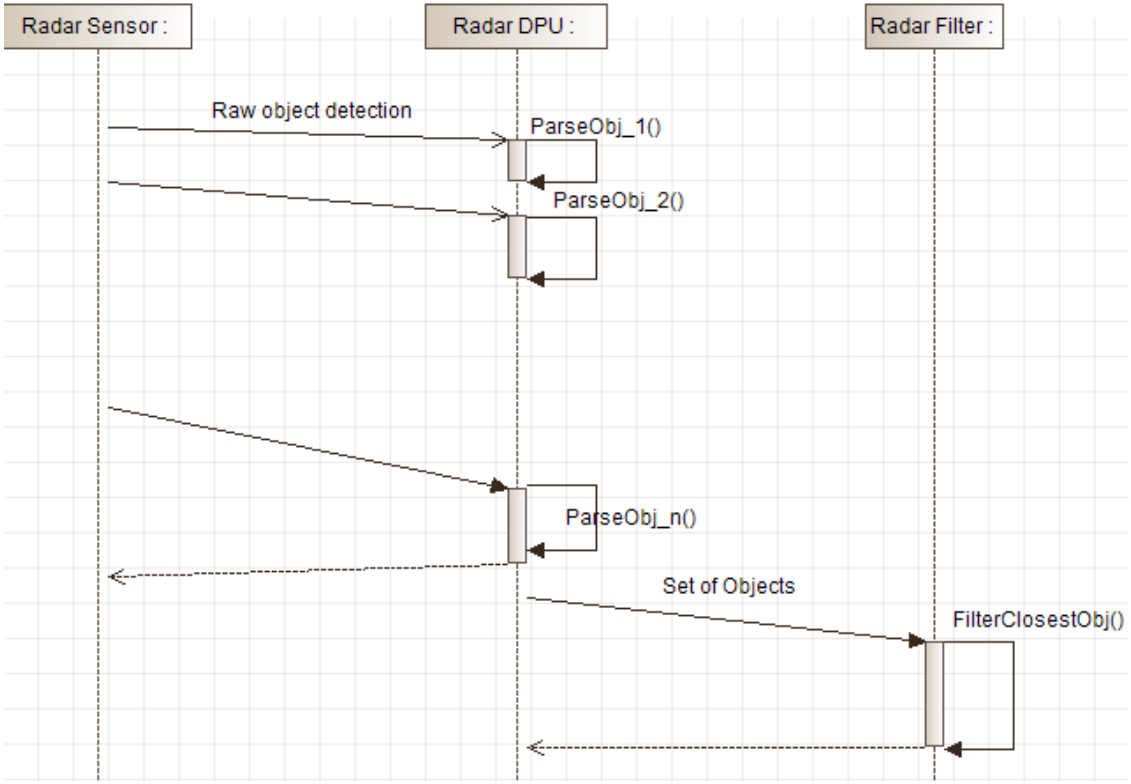
- Develop SysML models for the structure, behavior, requirements, and parametrics for the Radar Sub-system component of exercise 2 using Modelio.

HINTS

- Concentrate on how the software should be implemented by other programmers in the team.

SAMPLE MODEL

- Sequence Diagram Model



DAY 2 Exercises

- **Exercise # 1**:
- List the functionalities of a new AV obstacle detection and avoidance controller for the vehicle worked on day-1.
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- **Exercise # 2**:
- List a set of requirements and specify the structure, behavior, and parametrics of an AV obstacle detection and avoidance controller in a manual fashion (i.e., not using a specialized tool).
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- **Workshop:**
- Develop SysML models for the structure, behavior, requirements, and parametrics for the obstacle detection and avoidance controller of exercise 2 using Modelio.
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