





# Engineering Company

Kineton is an engineering company that provides services and products.

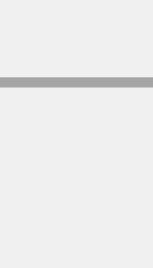
Kineton assists clients in the creation and development of their products and solutions in some of the major technological domains, such as Media Television, ICT & Telco, Automotive.



## Connection to the Universities

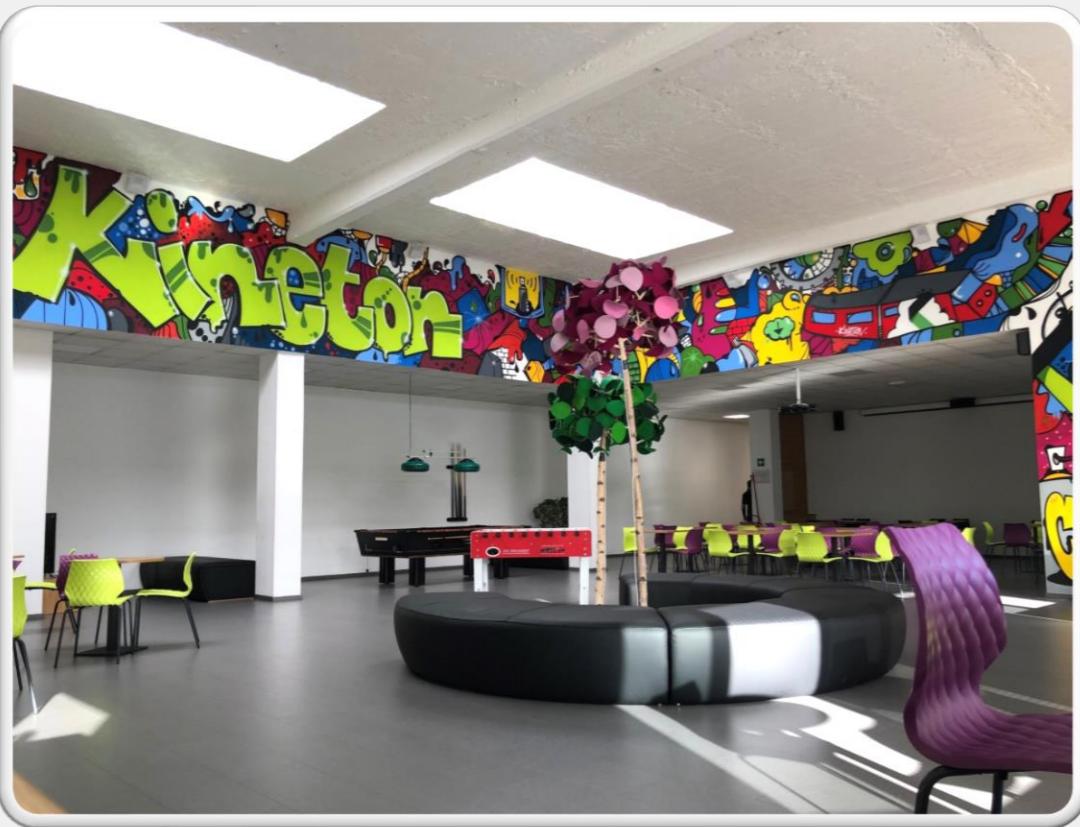
Kineton has relationships with some of the major Italian universities, and maintains a meaningful connection to the academic world. Academic preparation and skills play a key role for Kineton.

The Kineton Academy, fully supported by the company, prepares young resources for the world of business.



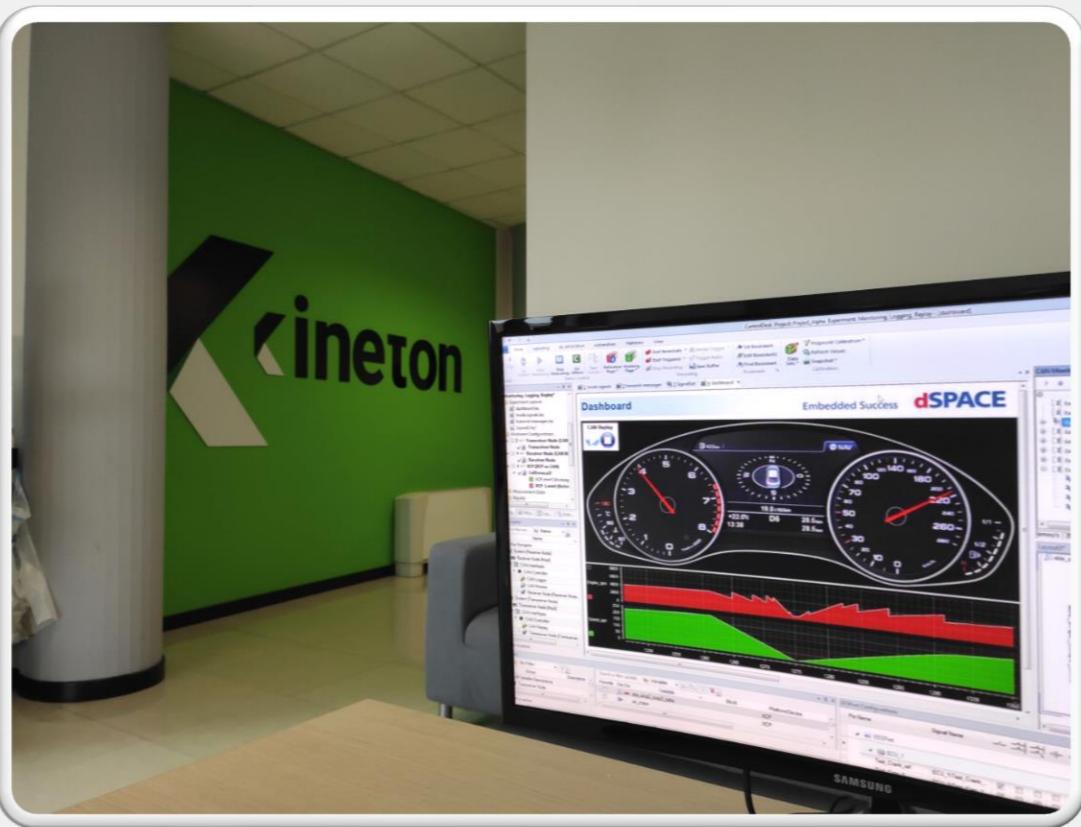


HEADQUARTER  
Napoli



004

BRANCHES  
Torino  
Milano



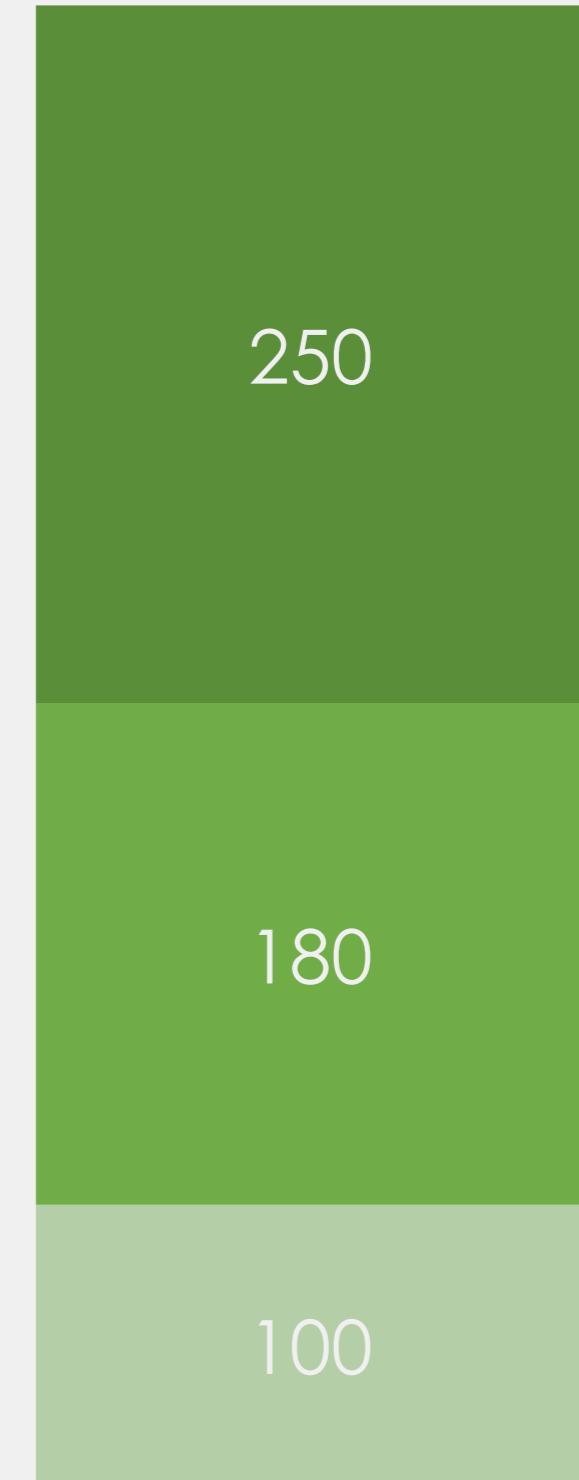
We are proud member of



■ 2017 ■ 2018 ■ 2019



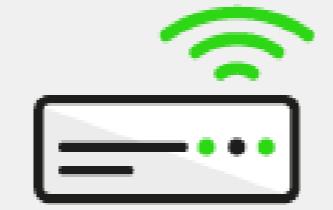
TURNOVER



EMPLOYEES

Numbers





## MEDIA SOLUTIONS

Design and development of multimedia solutions on embedded systems for DTT, SAT, OTT, IPTV, SmartTV devices.



## WEB & MOBILE SOLUTIONS

Design and development of web and mobile solutions.





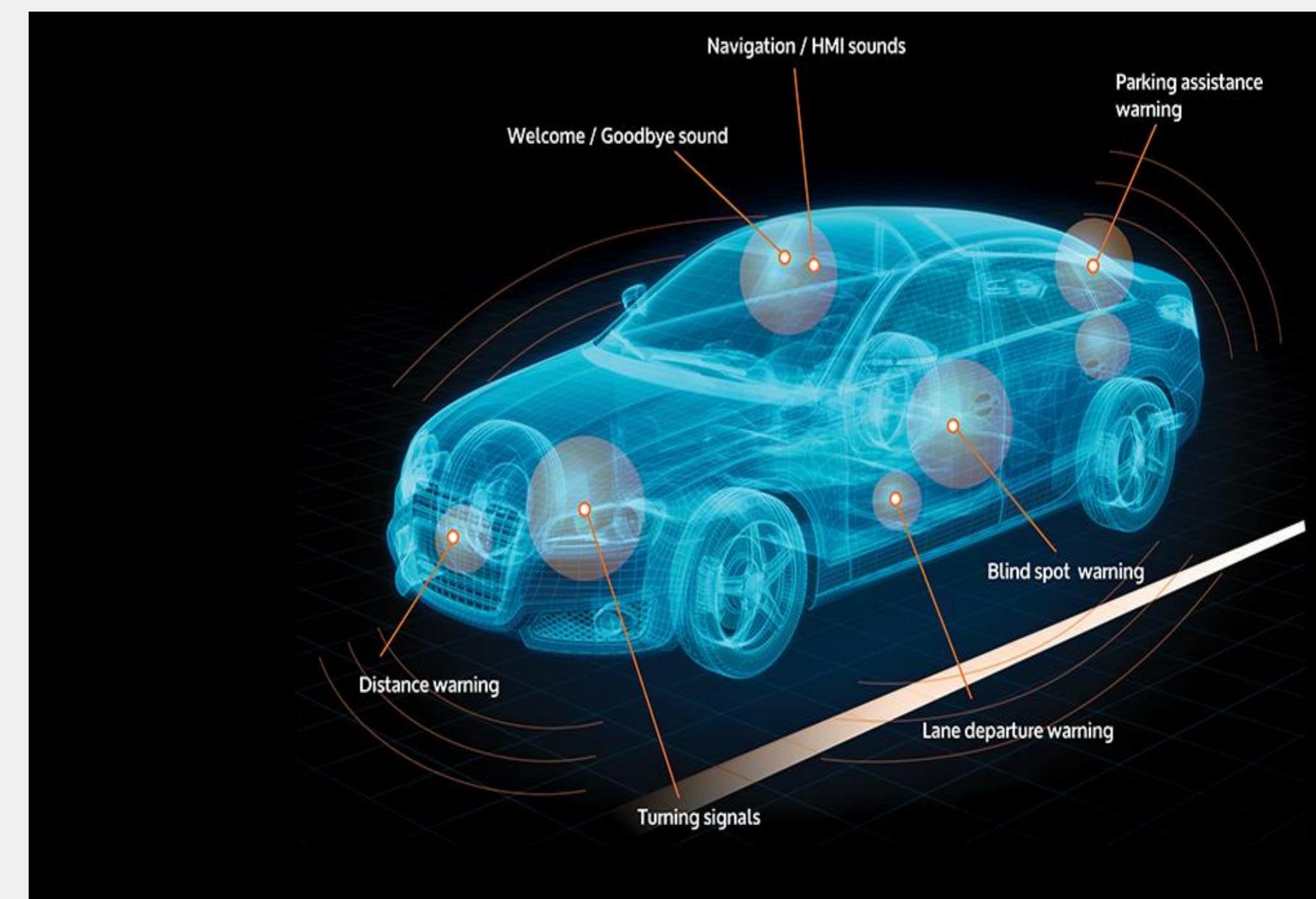
## AUTOMOTIVE

Design and development of embedded software solutions  
for Infotainment, Connectivity, Powertrain.



## ADAS SYSTEMS

Design and development of algorithms for autonomous  
driving solutions.



008



## AUTOMATION

Purposely designed automatic solutions for several environments: Scada System, Home Appliance, Electric Motor



## R&D PROJECTS

KINECAR

"If you can dream, you can do it" [Walt Disney]





### ENTERPRISE IT SOLUTIONS

Design and development of enterprise solutions for IT industrial aims.



### AR\VR & IoT SOLUTIONS

Design and development of AR / VR / MR and IoT apps and integration with third part solutions.





Automotive Control Strategies



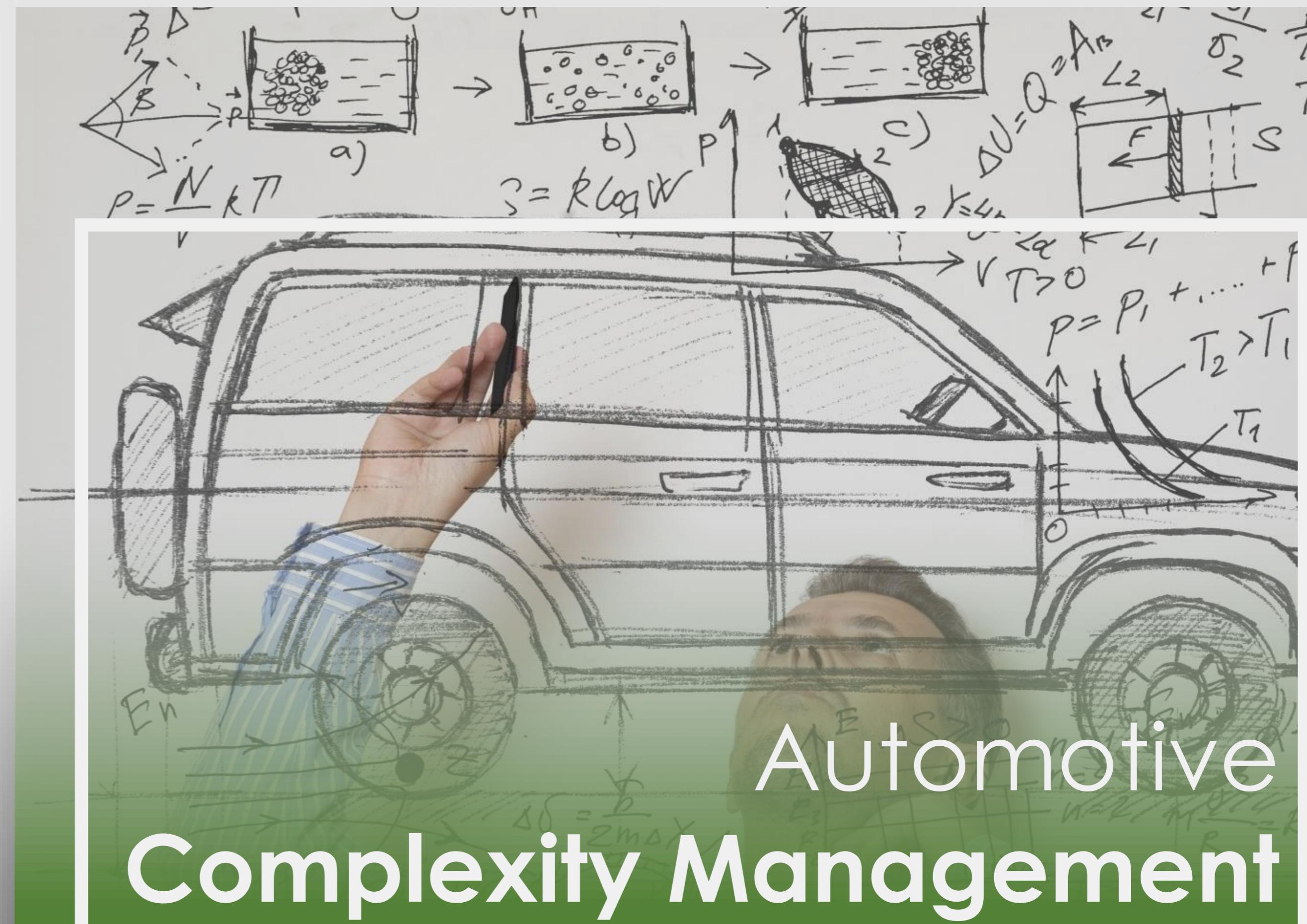
Simulation Loops



V-Cycle



A-Spice



# Automotive Complexity Management

Alone / EA6  
FREE SLACK

7:50

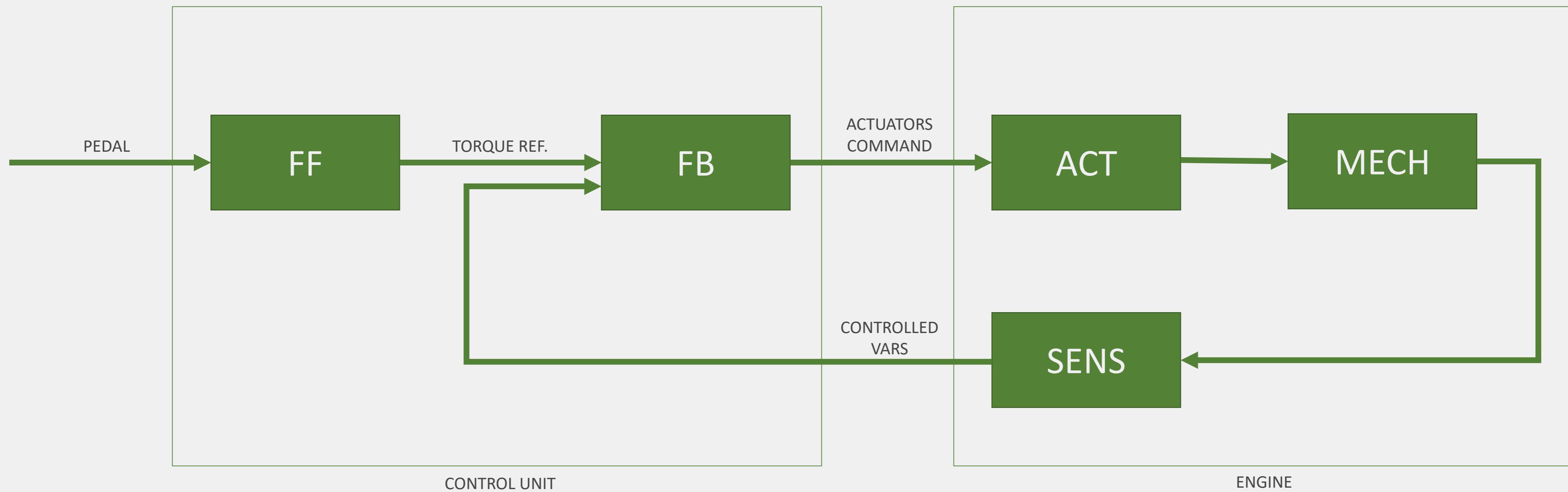
105.3-2

010

# Automotive Control Strategies



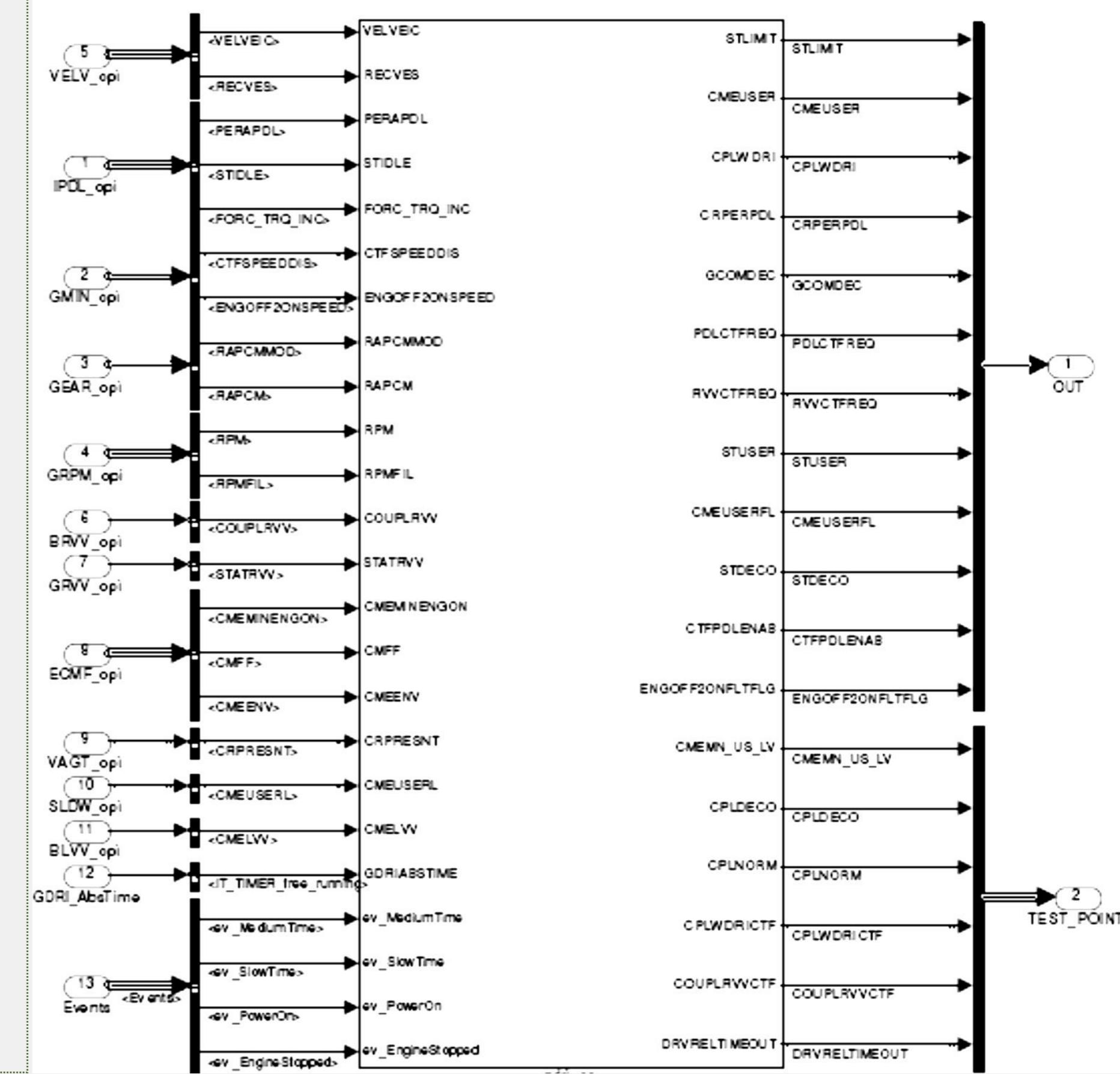
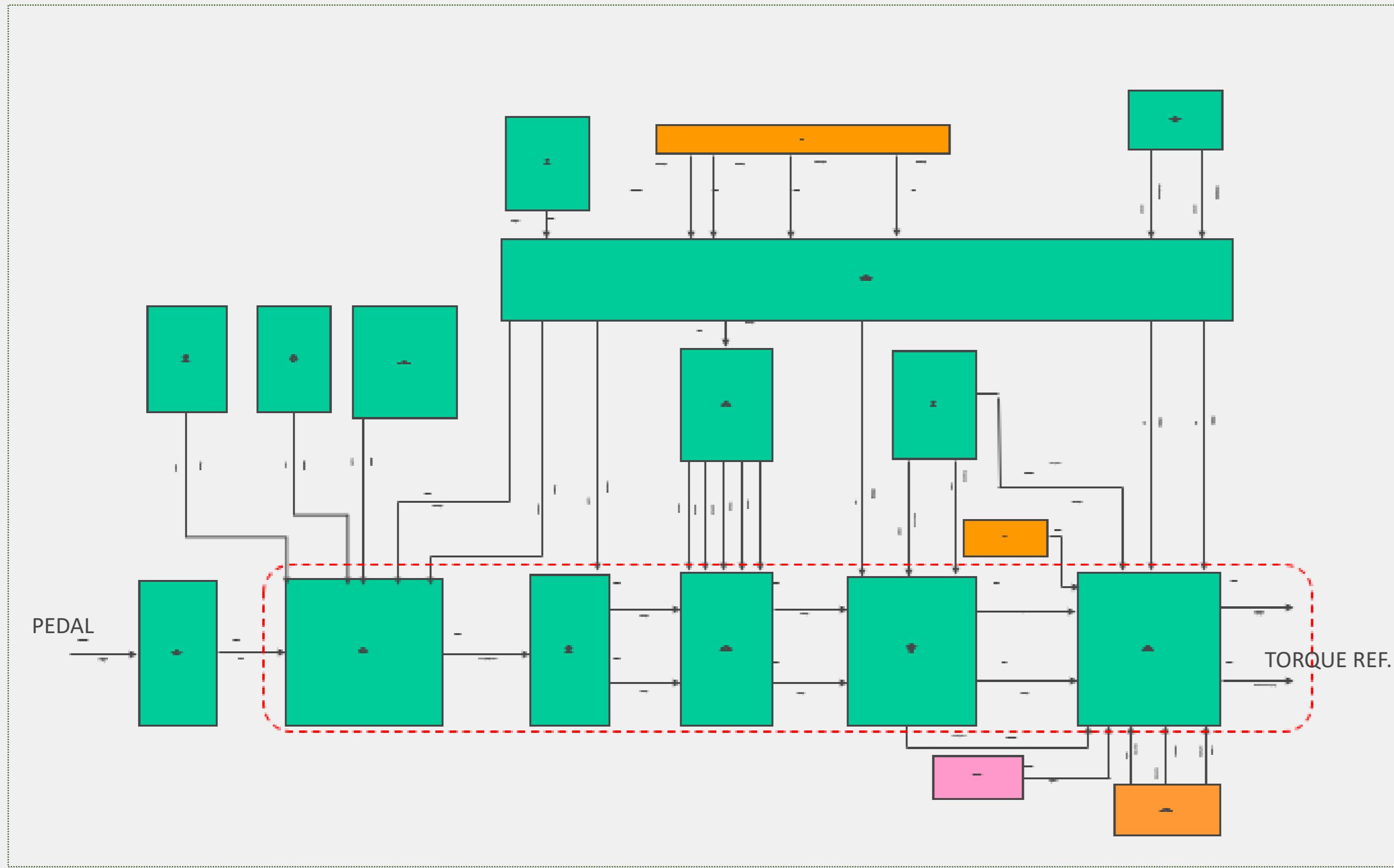
# Theory



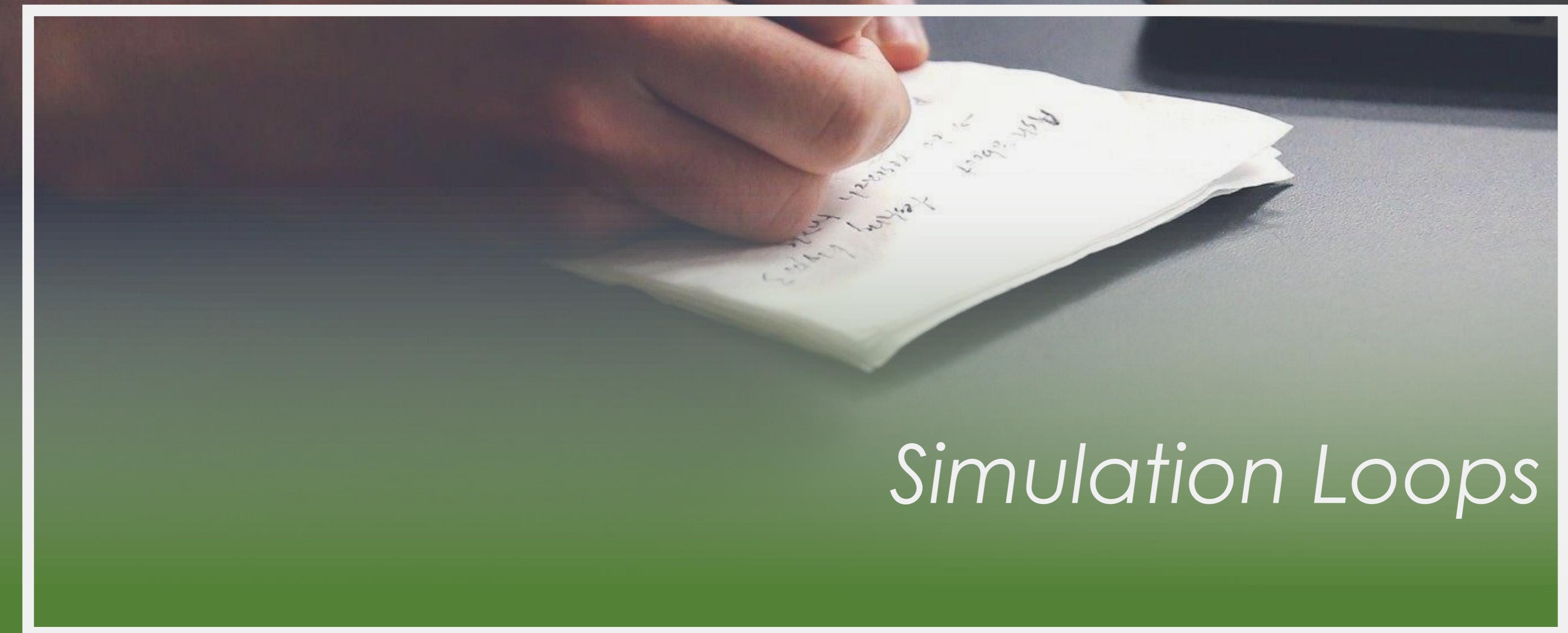


# Reality

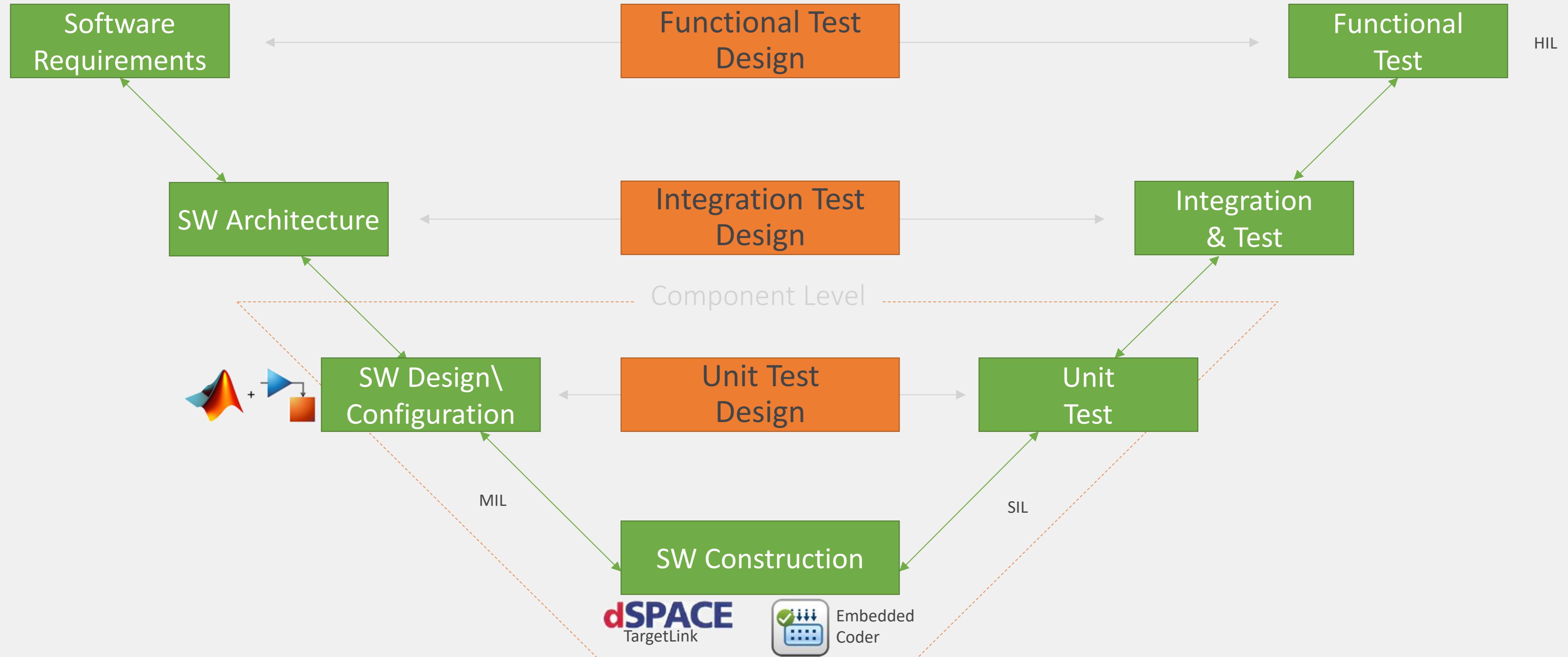
Internal combustion engine torque references calculation chain



e.g. a module for the one SWC code generation with more than 50 I/O interfaces!!!



*Simulation Loops*





# Low Level Design

## Implementation

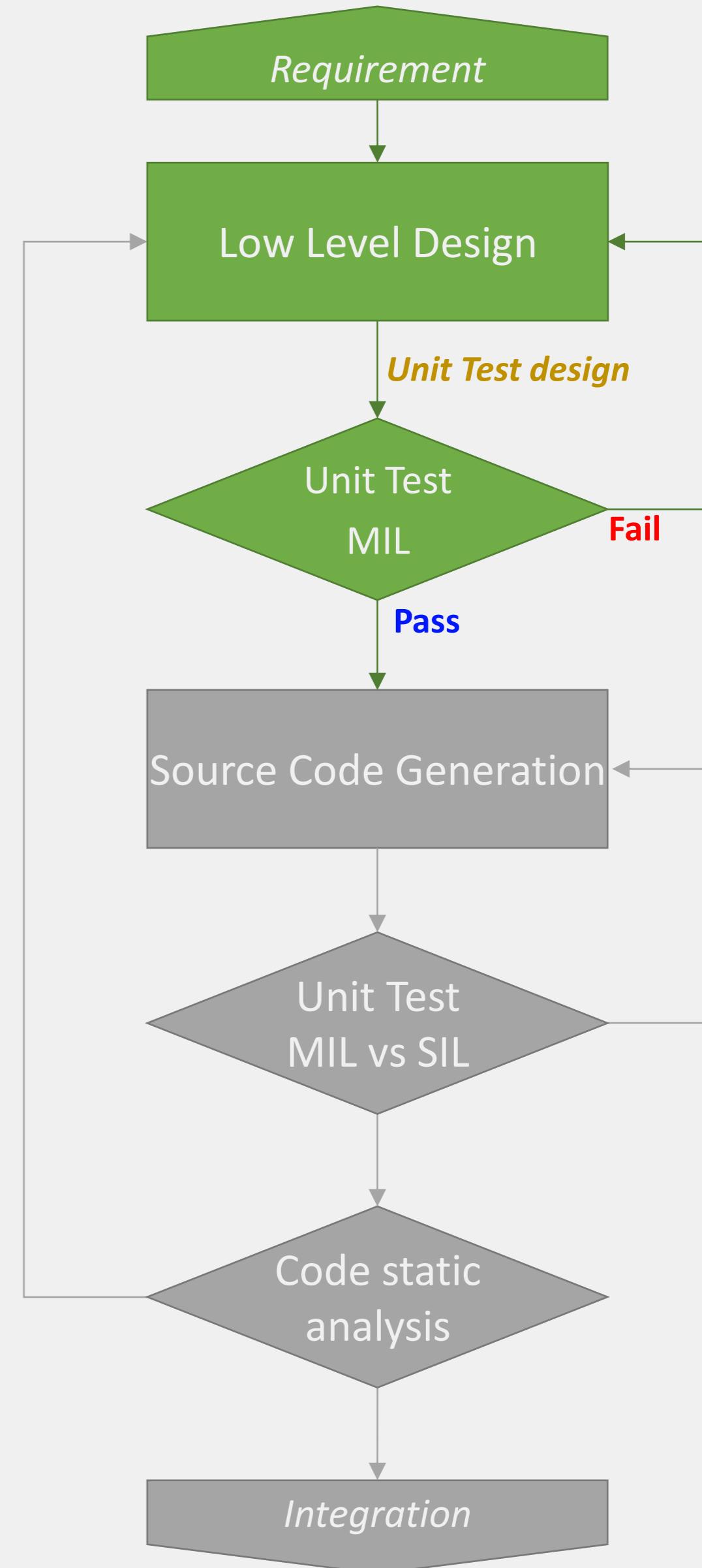
- Model construction in MATLAB/Simulink/Stateflow
- Check of Modeling and coding rules with Model Advisor - i.e. MAAB and MISRA-C coding standard
- Bi-directional links requirements ↔ model

## Testing

- MIL verification
- Unit tests design (test pattern definition)
- Bi-directional links requirements ↔ test
- Model coverage (execution, decision...)

## Documentation

- SWC Low Level Design diagram
- Requirements traceability report

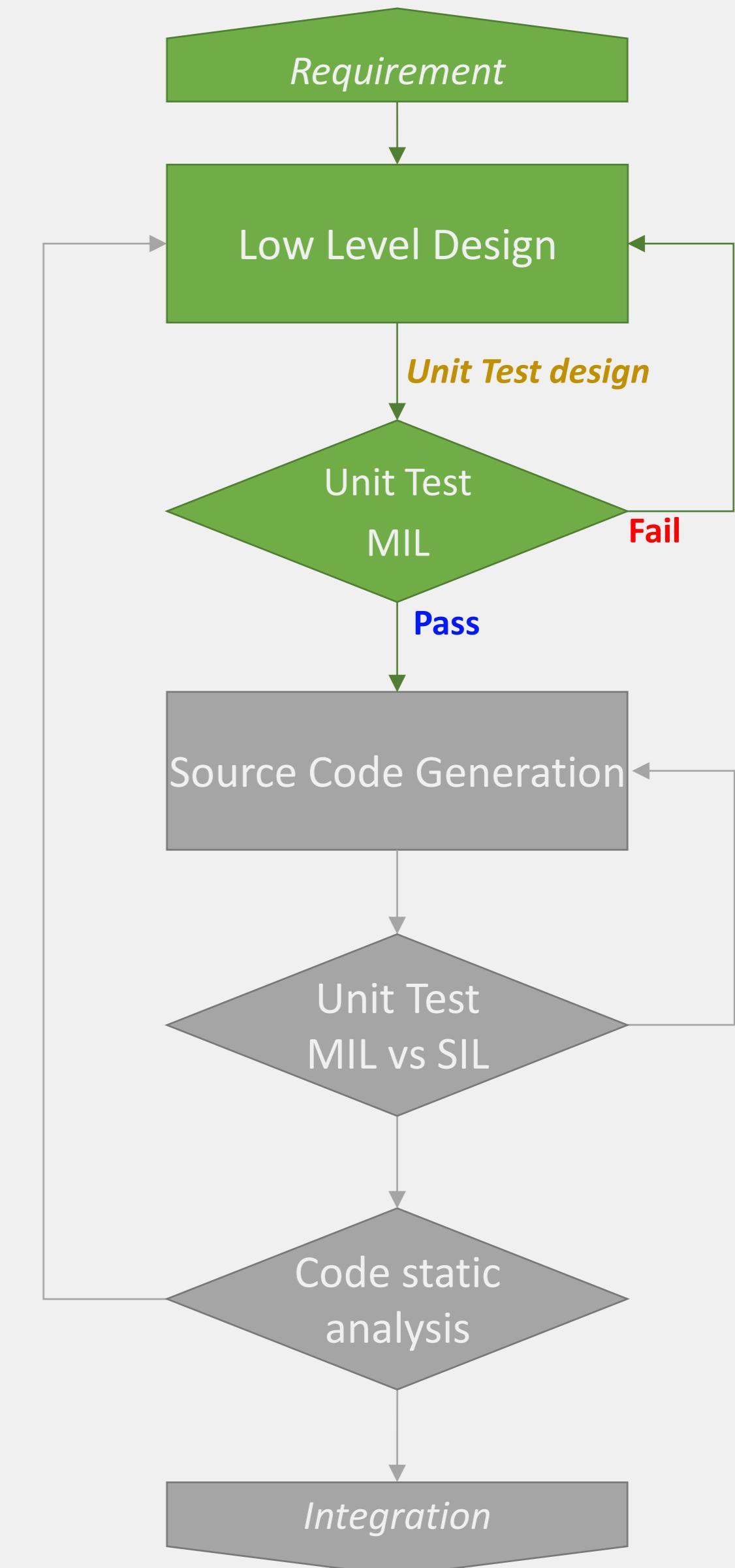
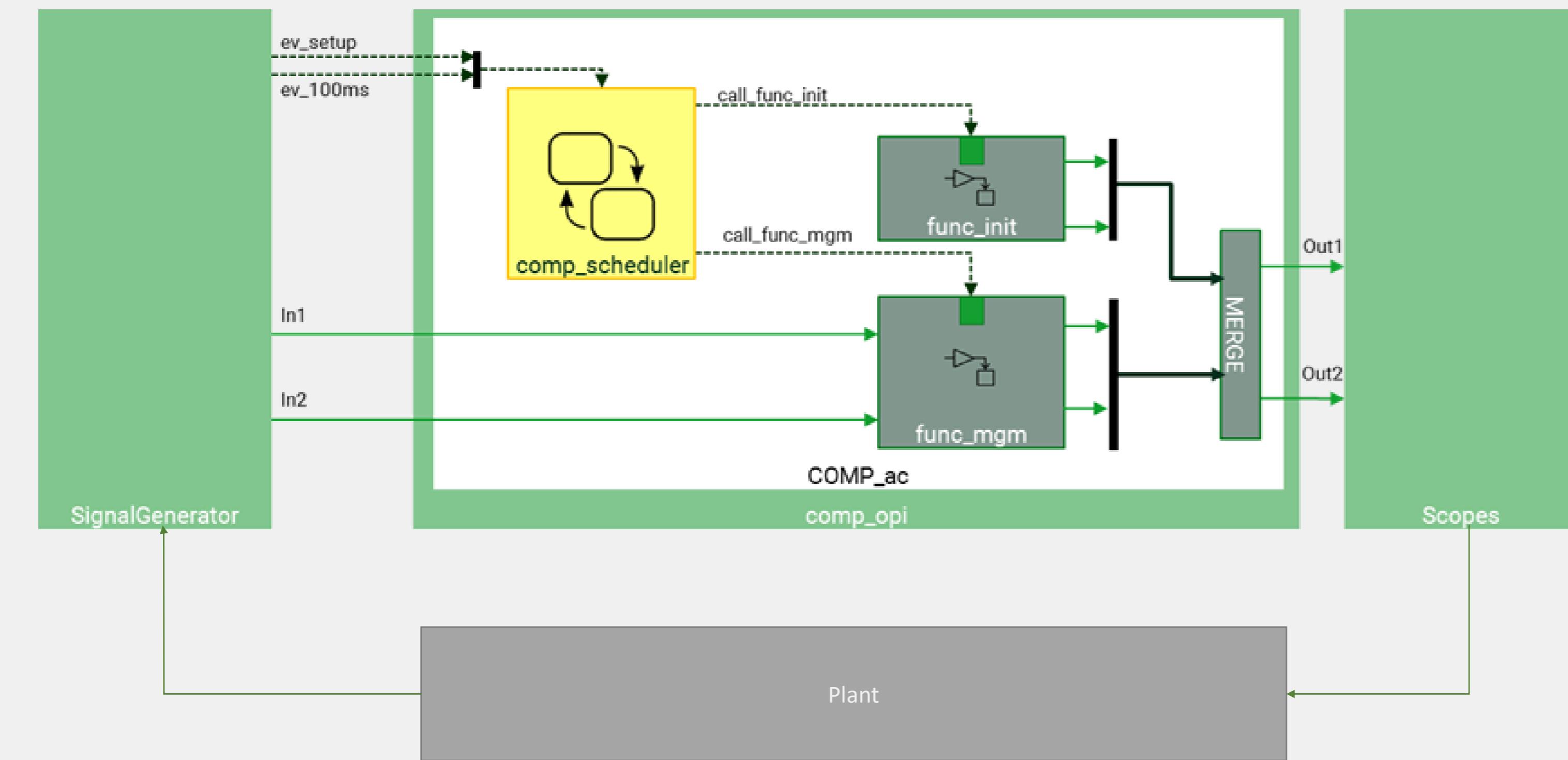




# Low Level Design

## Implementation

- Model construction in MATLAB/Simulink/Stateflow

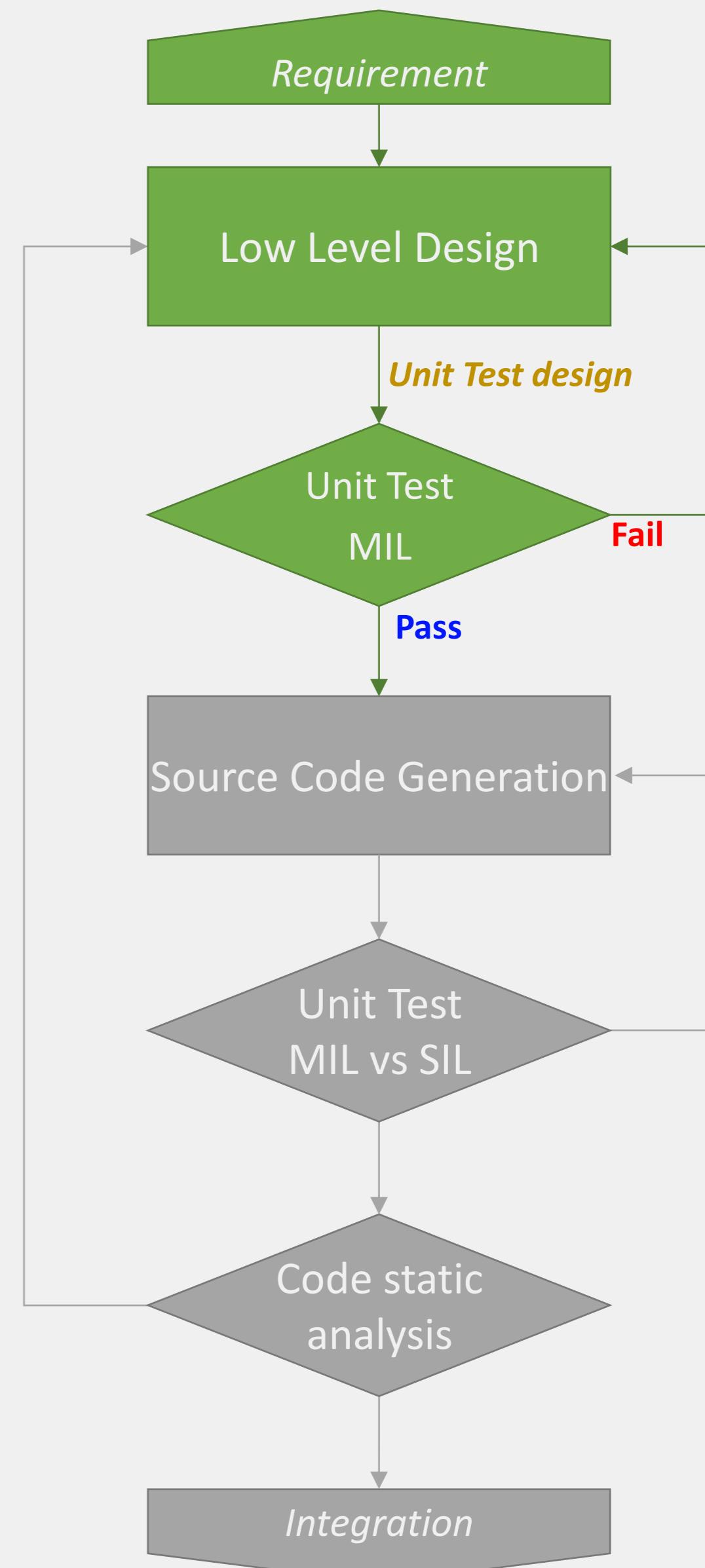
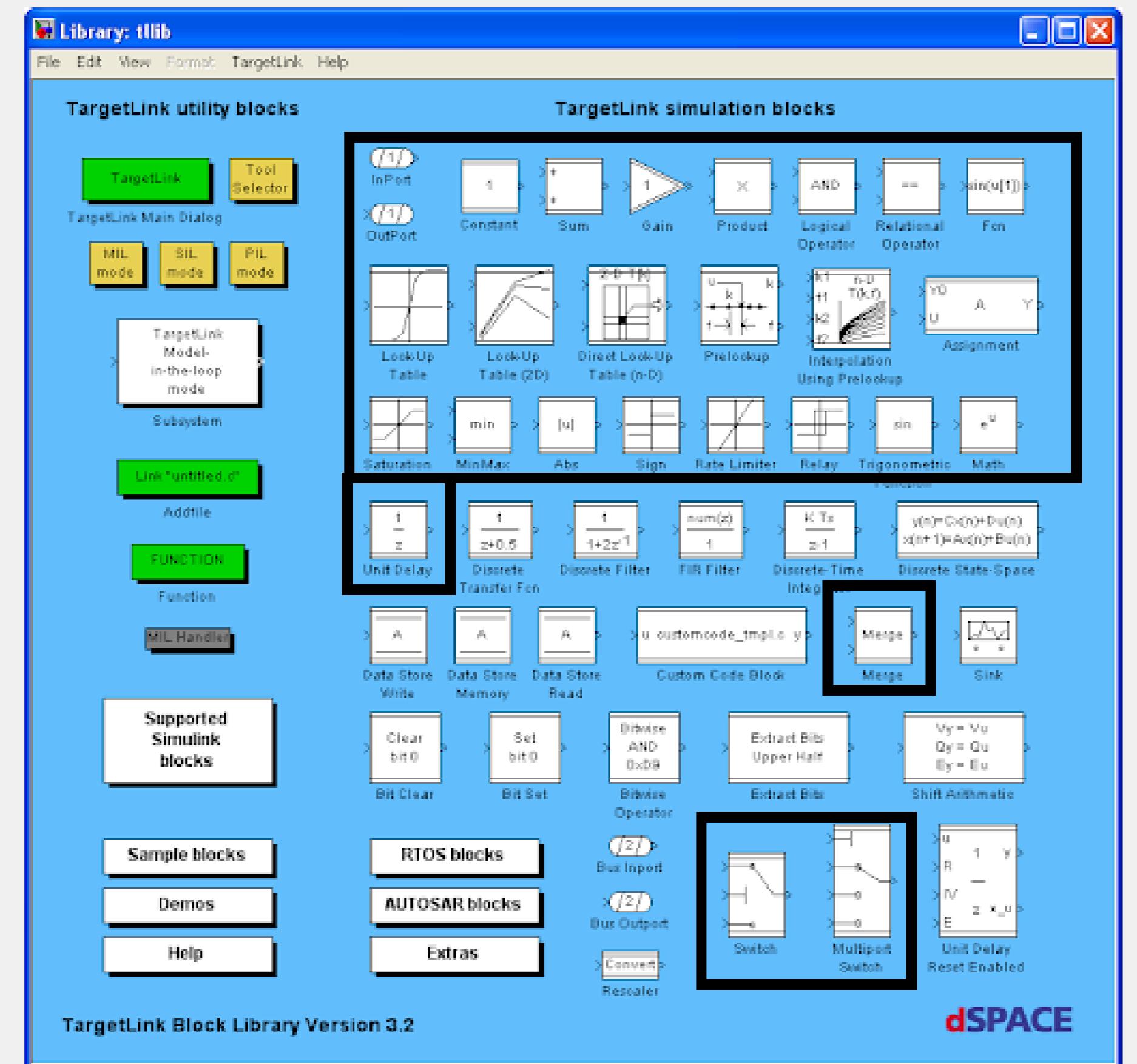




# Low Level Design

## Implementation

- Model construction in MATLAB/Simulink/Stateflow





# Code generation

## Configuration

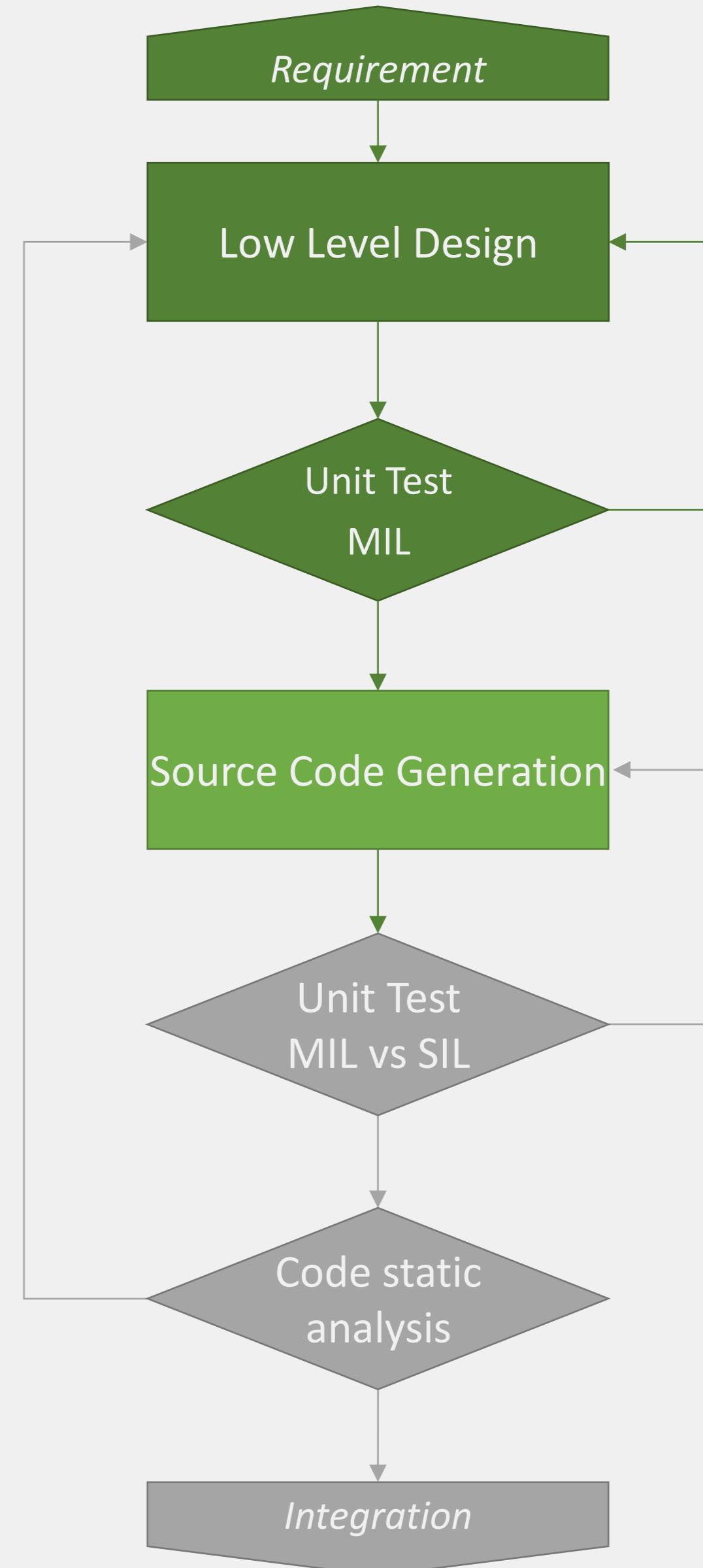
- Embedded real-time code generation parameters configuration (if needed)

## Code

- Mathworks Embedded Coder data dictionary objects
- Autogeneration of source code by using ERT engine
- Generated code inspection by using model navigator
- Bi-directional traceability model ↔ code

## Documentation

- Software Detailed Design diagrams





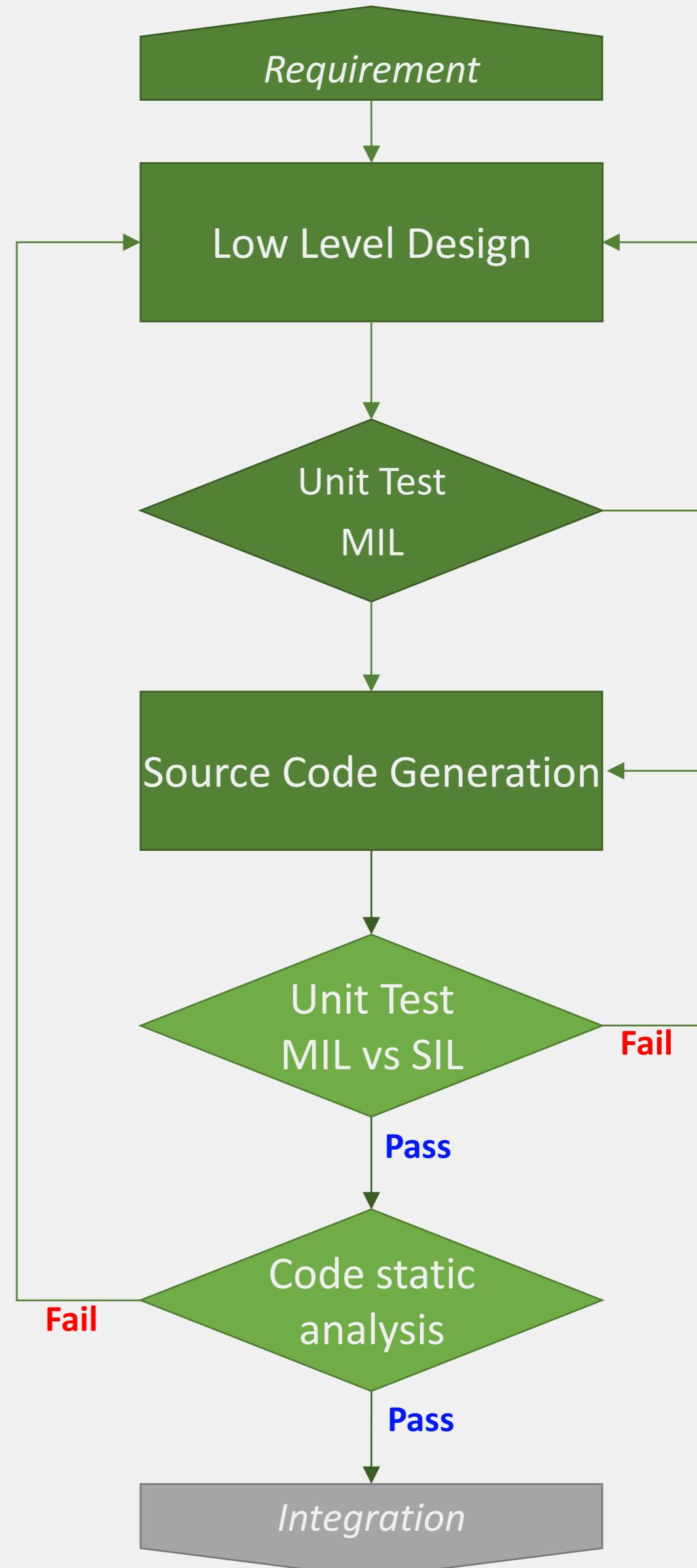
# Unit tests

## White-box tests

- Software in the loop VS Model in the loop
- SIL coverage analysis
- Static analysis
- MISRA C 2012 level 5 (Safety relevant)
- Bi-directional traceability model ↔ test

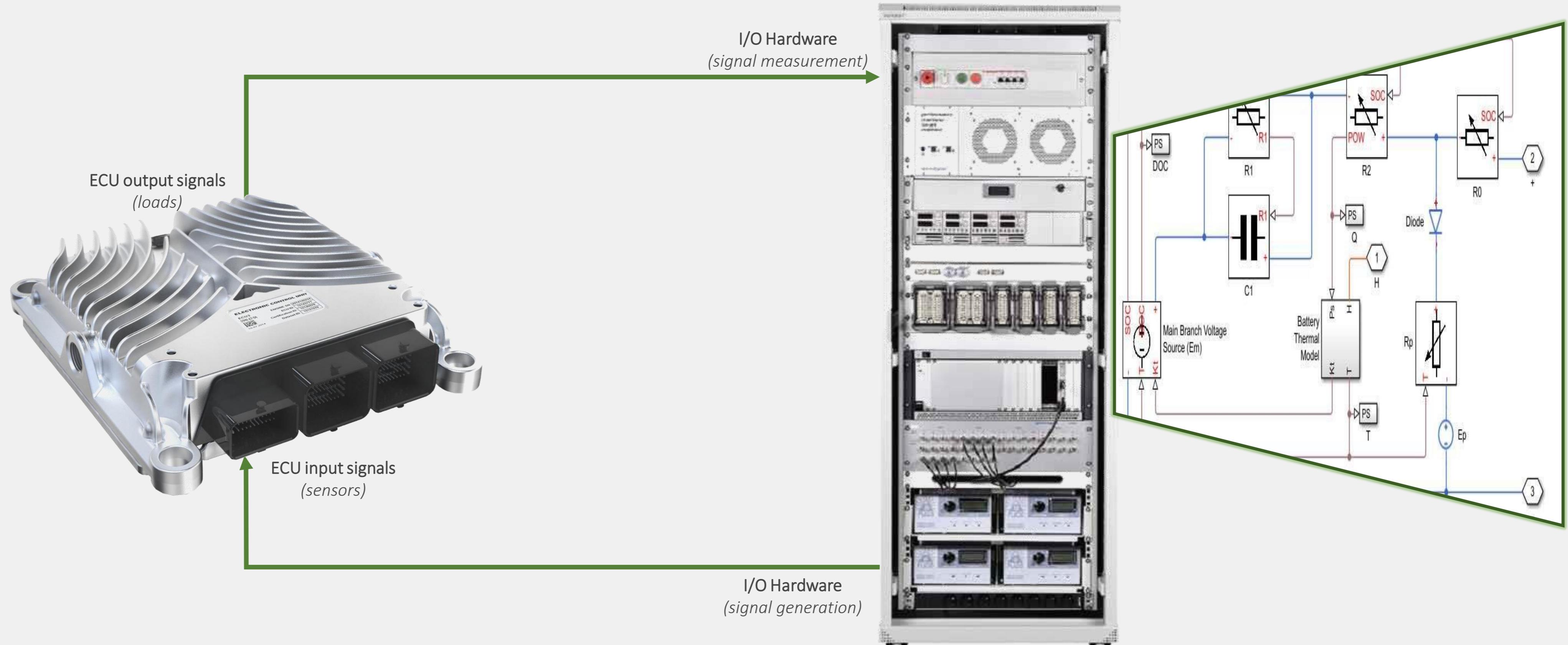
## Documentation

- Test reports





# Hardware in the loop



Alone / EA6  
FREE SLACK

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90.7

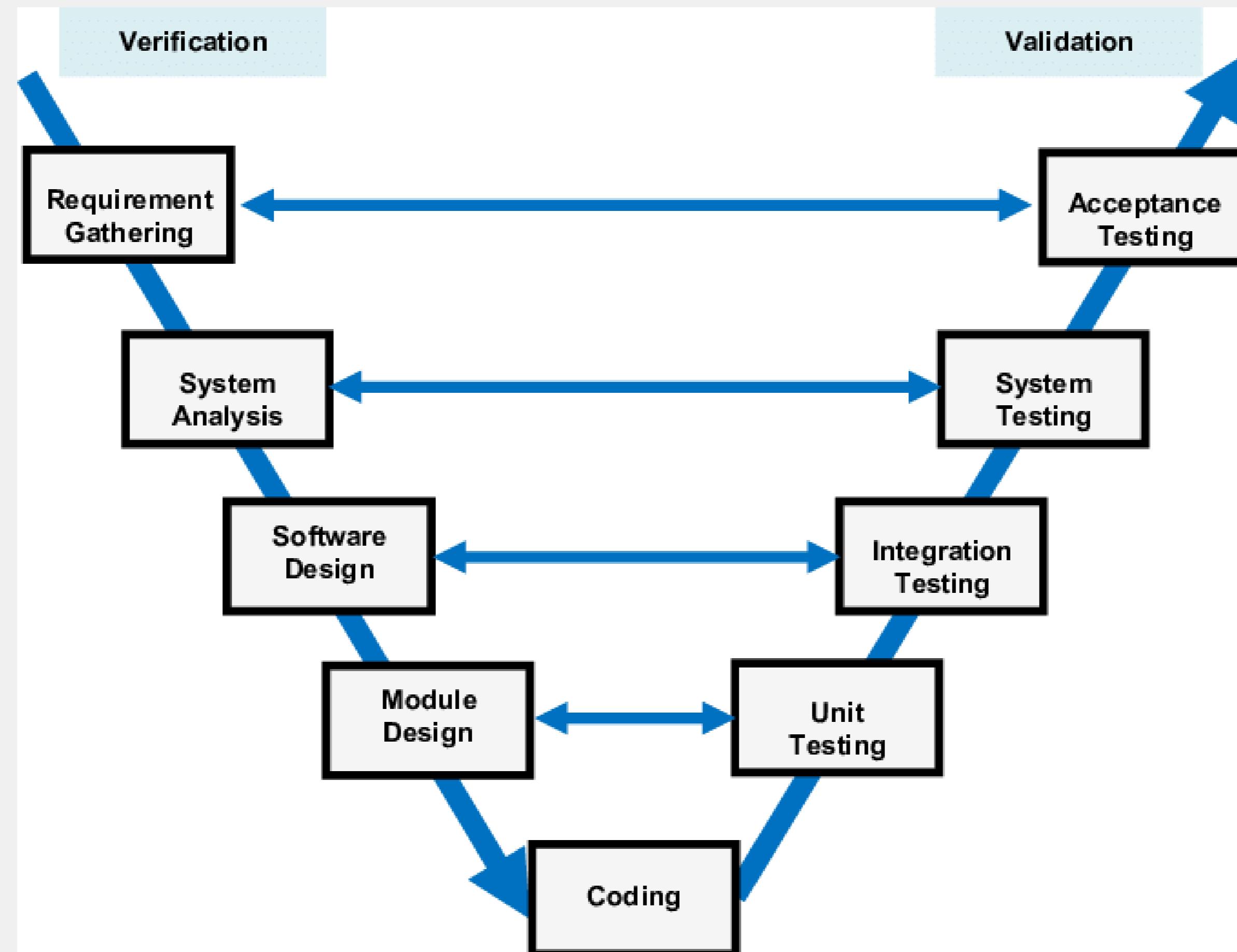
104.5

105.3-2

V-Cycle



Type “V-cycle” in Google Images: *I'm feeling lucky*





# Type “V-cycle” in Google Images: *I'm feeling lost*

Google v-cycle

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en 50126 systems engineering model software testing validation automotive iso 26262 product development verification

This diagram illustrates the V-Model life cycle for automotive software testing. It features a central vertical column of boxes: Requirement Gathering, System Analysis, Software Design, Module Design, Coding, Unit Testing, Integration Testing, System Testing, and Acceptance Testing. Horizontal arrows connect adjacent boxes in a clockwise direction. Additionally, there are diagonal feedback loops from Acceptance Testing back to Requirement Gathering and from System Testing back to System Analysis.

This diagram shows the ISO 26262 V-cycle Development Process. It consists of two parallel vertical columns: the left column for 'Specification of the requirements' and 'System design', and the right column for 'Implementation' (hardware and software) and 'Verification & Validation of the system'. The process involves iterative cycles between these columns, with specific steps like 'Refinement of specification and HW/SW design' and 'Unitary tests of HW and SW functions'.

This diagram provides a detailed view of the V-Model. It shows a top-level 'Requirements specification' box connected to a 'Code' box via a purple arrow labeled 'Functional specification'. Below this, a 'High Level Design' box is connected to a 'Low Level Design' box via a purple arrow labeled 'Functional specification'. The 'Low Level Design' box leads to a 'Code' box. Testing phases include 'Acceptance test plan', 'System test plan', 'Integration test plan', 'Unit test', and 'Code' (self-loop). External interfaces include 'Acceptance test', 'System test', 'Integration test', and 'Code'.

This diagram illustrates the essential aspects of the V-cycle software development process. It shows a vertical flow from 'Function requirement' through 'Function Development', 'Software Development', 'Unit test', 'HIL test', 'Software Integration', 'Vehicle test', and 'Vehicle calibration' down to 'Function requirement'. Production readiness is indicated by a vertical scale from 'High' at the bottom to 'Low' at the top. Various test types like 'ML test', 'SL test', and 'HIL test' are shown along the path.

V-Model life cycle for the automotive software te...  
researchgate.net

ISO 26262 V-cycle Development Process. | Download Scien...  
researchgate.net

Software Development Life Cycle - V ...  
pinterest.com

Essential aspects of the V-cycle software de...  
x-engineer.org

This detailed V-Model diagram shows the hierarchical breakdown of the process. It includes levels L0, L1, and L2. At L0, there are 'SYSTEM' and 'PRODUCT' boxes. 'SYSTEM' contains 'System functional needs', 'Preliminary hazards analysis (PHA)', 'Functional requirements', 'Safety requirements & undesirable events (UEs)', 'System architecture', 'System safety analyses', and 'Product architecture'. 'PRODUCT' contains 'Products safety analyses' and 'HW block architecture'. At L1, 'SYSTEM' contains 'System validation', 'System integration & verification', and 'Product integration & verification'. 'PRODUCT' contains 'HW block integration & verification'. At L2, 'SYSTEM' contains 'HW block safety analyses'.

This diagram shows the V-Model structure with four main phases: PLANNING, REQUIREMENTS, ARCHITECTURE, and INTEGRATION TESTING. These phases are interconnected by bidirectional arrows. Above the V-shape, there is a 'SYSTEM' box and below it is a 'PRODUCT' box. The 'SYSTEM' box connects to 'PLANNING' and 'REQUIREMENTS'. The 'PRODUCT' box connects to 'ARCHITECTURE' and 'INTEGRATION TESTING'. The 'REQUIREMENTS' phase has a downward arrow pointing to 'SPECIFICATION'.

This diagram provides a detailed view of the V-Model phases. It shows 'User Requirement Specification' leading to 'Functional Specification' and 'Design Specification'. 'Functional Specification' leads to 'GENERAL DESIGN' and 'DETAILED DESIGN'. 'GENERAL DESIGN' leads to 'QF Protocol' and 'QO Protocol'. 'DETAILED DESIGN' leads to 'QF Protocol', 'QO Protocol', 'OPERATIONAL QUALIFICATION', and 'INSTALLATION'. 'QF Protocol' leads to 'TESTING', 'QO Protocol' leads to 'TESTING', and 'OPERATIONAL QUALIFICATION' leads to 'TESTING'. Finally, 'TESTING' leads to 'Report' and 'Acceptance'.

This diagram shows the V-Model phases and their relationships. It starts with 'Requirements' leading to 'System Requirements', which then lead to 'Global Design' and 'Detailed Design'. 'Global Design' leads to 'Integration Test Cases', and 'Detailed Design' leads to 'Unit Test Cases'. Both 'Integration Test Cases' and 'Unit Test Cases' lead to 'Acceptance'.





# SPICE

ISO/IEC 15504

ISO/IEC 15504 *Information technology – Process assessment, also termed Software Process Improvement and Capability Determination (SPICE)*

PROCESS REFERENCE MODEL | PROCESS ASSESSMENT MODEL

## ASpice

Automotive SIG

### Traceability

bidirectional links

### Documentation

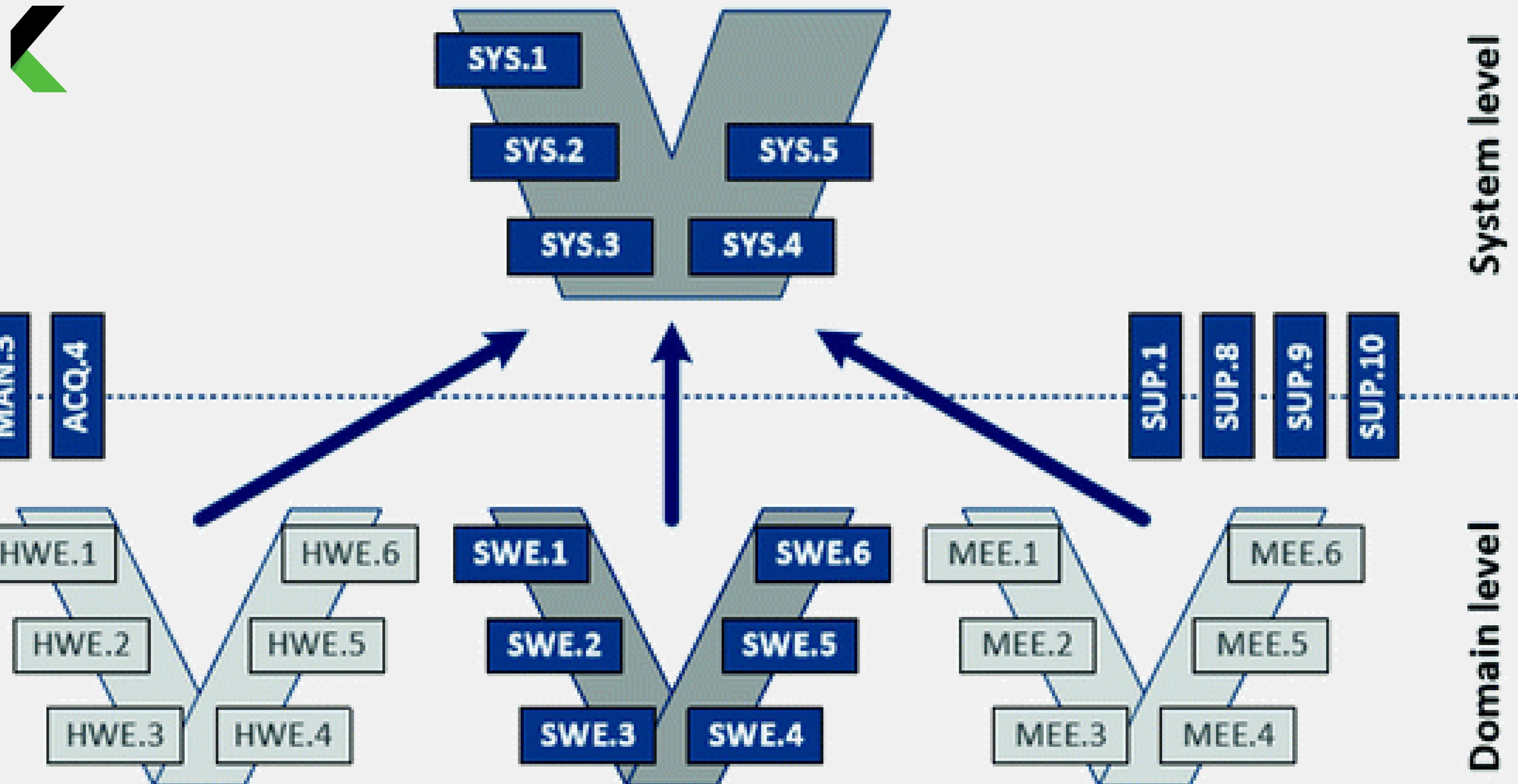
outcomes

### Project

Project plan, test plan, release plan, test strategy...

### Report

checklist, automatic report







## Argomenti tesi [automotive@kineton.it](mailto:automotive@kineton.it)

### ADAS

- Realizzazione di un sistema di mantenimento della corsia (Lane Keeping System);
- Progettazione ed implementazione di un sistema di obstacle avoidance per veicoli terrestri;
- Progettazione ed implementazione di un sistema di "Adaptive Cruise Control";
- Progettazione ed implementazione di un sistema di frenata d'emergenza;
- Sviluppo di sistemi cooperativi basati sulla comunicazione veicolo-veicolo e veicolo-infrastruttura

### HIL

- Sviluppo di una On board diagnosis wireless interface
- Sviluppo modelli simulatore BEV/PHEV, BMS, EM Controllers, ecc...

### MBD

- Funzionalità avanzare Kinetic IPC

# KINETON s.r.l.



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