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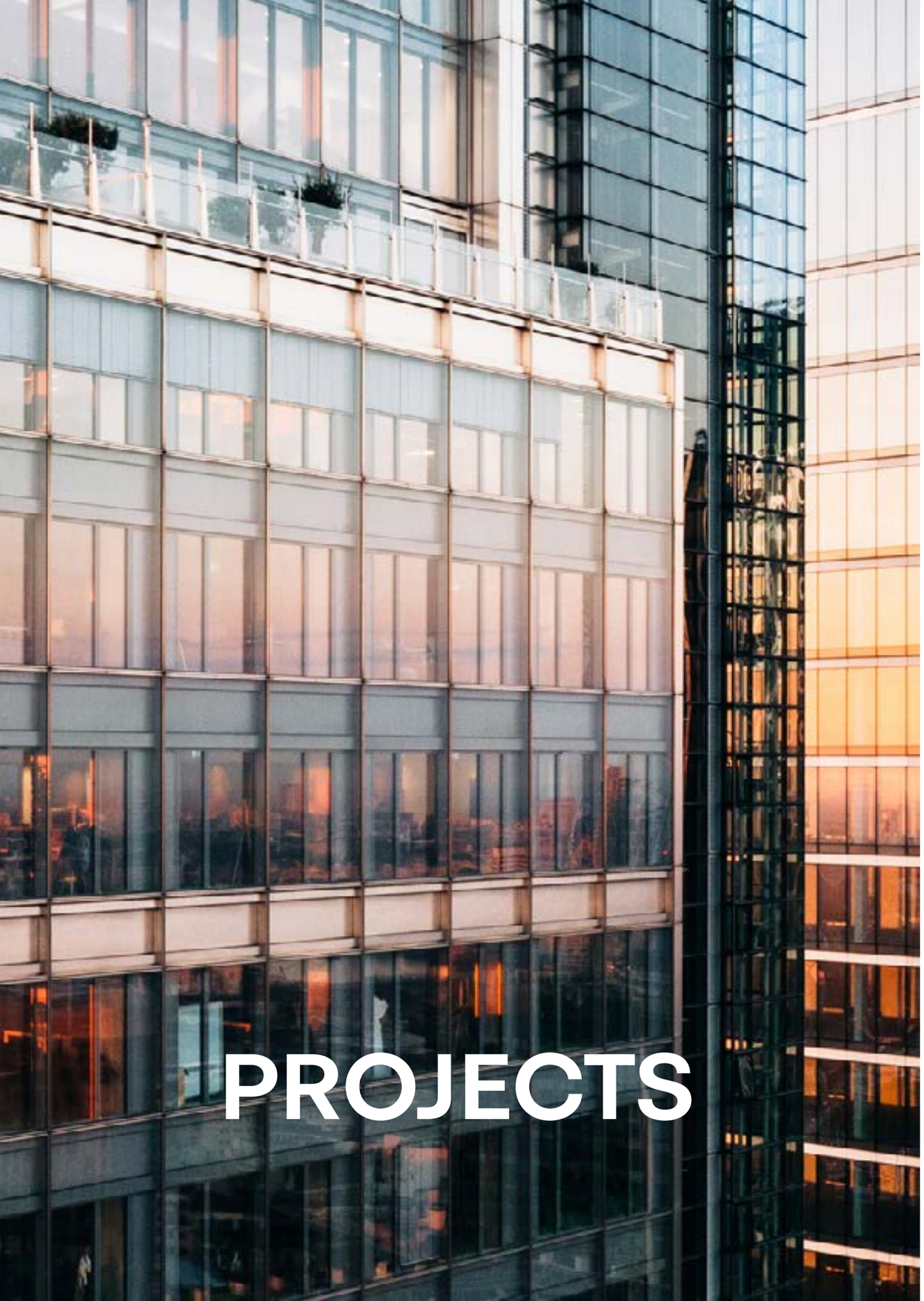

PROJECTS

3-7 June

Application period

8-12 June

Selection period

22-26 June

Signing of agreements

29 June–31 July

Start Practice Program

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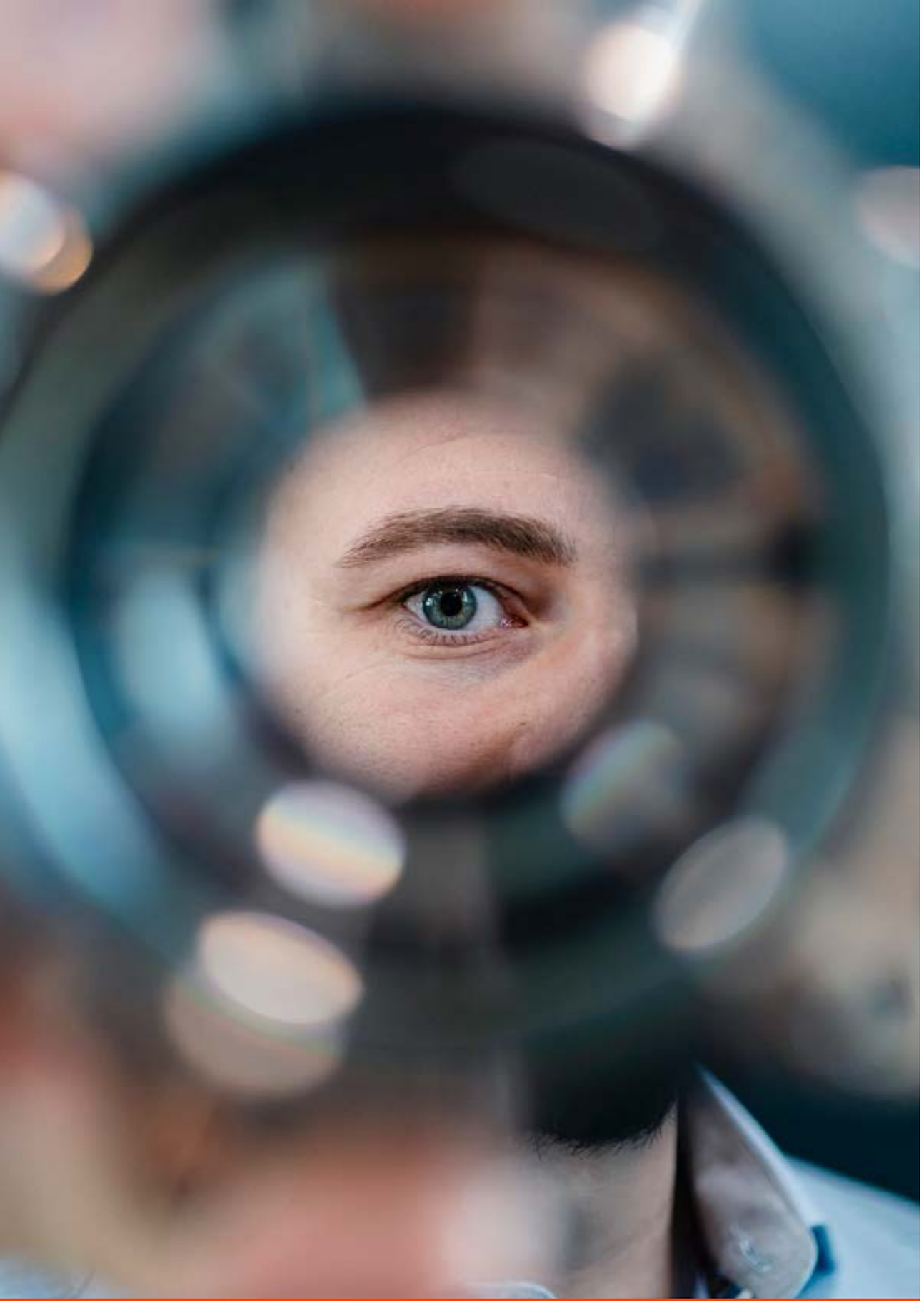


Arch as a core principle of Software Development

Project Description
Aware of architectural solutions in software development that should be respected to obtain cheap, high-quality code and avoid tehnical debt.

They should also learn how to avoid technical debt in projects that already violate good practices without increasing development costs.

Main Responsabilities
Study. Research & Development. POC Implementation.

Knowledge Required
Procedural programming; An understanding of object-oriented programming and a desire to grasp the essence. Preferably: Template metaprogrammingMoto:
You don’t need to know everything; you only need to know the things that allow you to deduce everything.

Software Project Reporting Application

Project Description
This project aims to give students hands-on experience with modern software engineering and cloud-native technologies by developing a Software Project Reporting application. The platform will collect, store, and visualize key project metrics, enabling clear insight into project health, progress, and performance.

The project focuses on practical learning outcomes: system design, containerization, observability, automated deployments, and collaborative development.
It is well-suited to bridge academic knowledge with real-world engineering practices and prepare students for modern DevOps-driven software projects.

Main Responsabilities
Students will design and implement a backend based on PostgreSQL for structured data storage, integrate Grafana for real-time dashboards and reporting, and package services using Docker.

The application will be deployed and orchestrated in a Kubernetes environment, with infrastructure defined and managed through Terraform to demonstrate Infrastructure as Code principles.

Throughout the project, students will apply best-practice deployment and monitoring techniques commonly used in production systems.

Knowledge Required
-Knowledge of OOP principles
-Basic database knowledge
-Basic knowledge of version control solutions
-Basic knowledge of Linux usage
Nice to have:
Docker, Kubernetes knowledge, DevOps concepts techniques commonly used in production systems.

Human vs AI Brake System Testing

Project Description
1.Analyse and understand how the actually braking systems are designed and work.

2.Compare the testing approach between AI and Human by analysing requirements

3.Transpose test scenarios and evaluation into HIL environments

Main Responsabilities
Increase the knowledge for braking system overview and perspective how AI tools can contribute for improvements.

Knowledge Required
Basic knowledge: Hardware, Programming, Physics, Testing

ISSA

Project Description
M3 - Automotive HPC Foundations.
You will discover the backbone of automotive: communication protocols, security and safety standards. M3 also describes challenges and opportunities in combining performance, safety and security within the new architecture of automotive HPC.
Combined, these modules provide a detailed introduction in the complex world of automotive systems.
So join us if you want to be amazed by the wonders in the automotive systems

Main Responsabilities
- Actively participate in all courses and hands-on projects.
- Study and research automotive concepts.
- Apply theoretical info into hands-on projects.
- Present project implementation

Knowledge Required
M1 - Automotive DevOps Foundations
a) Must: Bash, shell, git
b) Nice to have: OS, Python

M2 - Automotive Driving Foundations
a) Must: Python beginner
b) Nice to have: Python intermediate/ advanced, Numpy, OpenCV, Sockets

M3 - Automotive HPC Foundations
a) Must: Pythonbeginner
b) Nice to have: Artificial Intelligence

Autonomous Robort for System Testing

Project Description
Scope of the project is to continue the development of an autonomous robot that will perform system testing tasks inside a special room.

The concept is already functional based on omnidirectional 4 wheels chassis with Arduino Electronic Control Unit and indoor navigation system.

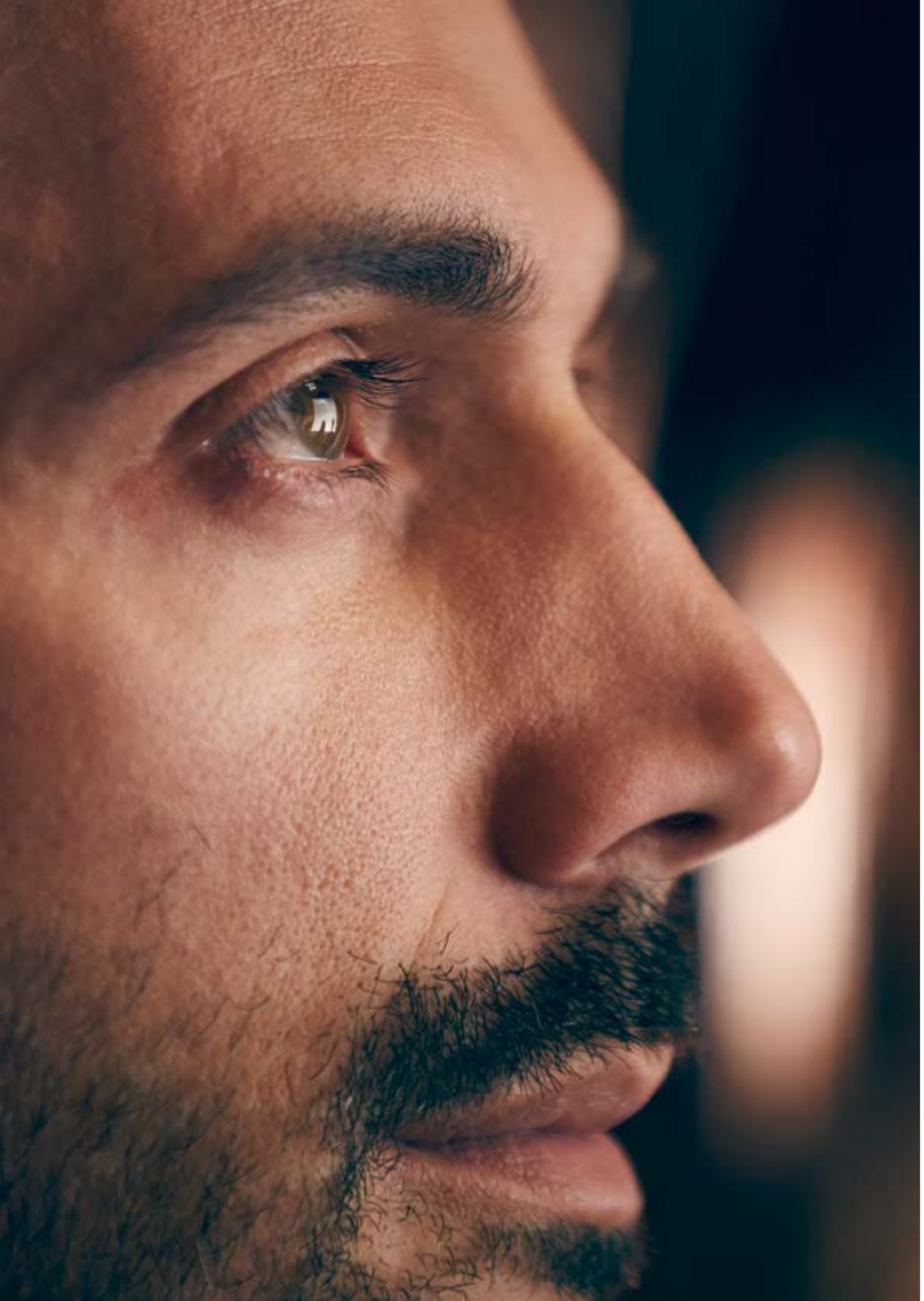
Its main function is to precisely place some objects inside the test room. All the maneuvers and communication should be done automatically as part of a bigger automation system in which will be integrated.

Main requirements:
- Shall be able to position an object on the floor;
- Shall cover the entire floor surface of 9x8 meters;
- positioning accuracy +-5mm;
- payload 50 kg;
- Shall have low reflectivity for ultrasonic waves and shall not emit ultrasonic waves after positioning is done;
- Shall have the possibility to be programmed to perform a list of tasks(eg. move to specific list of positions in an specified order, communicate position, communicate positioning complete);
- Should have interfacing capabilities in order to be integrated in other automation systems;

Main Responsabilities
You will contribute while also learn in a multidisciplinary team to the following planned features/improvements according to your interests or skills:

Improve precision and coverage for indoor navigation system(ultrasonic based).Improve ultrasonic echo reduction treatmentof the test room. Upgrade the 5MP reference camera to fisheye lens. WiFi controlled light for shooting the reference pictures with main lights off. WiFi controlled warning display at the room entrance (displaying for eg.”Keep out. Testing ongoing”). Feed the testing setup with Roboto dometry data via CAN or Ethernet. Feed robot Navigation data into testing setup as reference(internal built tools). Improve UDP communication between the devices that are part of the automation. Use robot odometry to improve navigation accuracy(information/sensor fusion). Develop a self-charging algorithm for the robot. Develop robot capability to move on complex trajectories with changing speed (based on simple omni directional moves). Develop robot capability to have a given orientation when reaching target coordinates. Test the robot’s camouflage against to ultrasonic sensors. Acquire environmenta conditions and feed data into test setup and device under test(automotive ECU).Mechanical concept for tuning sensor positioning on a real vehicle bumper. Power supply separation on the testing setup to avoid power drainbetween different components. Testing setup PCB + harness design. Create a mechanical maintenance guide for the testing setup. Self-charging docking station and battery monitoring to trigger self charging routine. Robot safety stop when bumping in obstacles(to avoid motor overload and safely operate at higher speeds). Excessive discharge protection for robot’s battery. Investigate battery upgrade from Pb 12V 62Ah to Li-Ion 12V100Ah. Improve robot’s wheel torque(eg. Bychanging the gear ratio). Estimate robot’s load capacity (nominal and peak) and propose upgrade for robot’schassis for higher loads(>50kg).

Knowledge Required
Basic knowledge on: Physics, Programming, Electronics, Electrical engineering, Mechanics, Automatics.



Function Development from easy to complex

Project Description

Modern engineering systems are rarely built in a single step. Complexity emerges gradually – from initial concepts to subsystem interactions and full system integration. Without a disciplined framework, development efforts may result in scope reduction, integration failures, and poor traceability.

This project guides students through the full lifecycle of automotive function development, using the V-Cycle and Systems Engineering guideline of INCOSE as the structuring framework. By progressing from simple to complex functions, students build both technical competence and process discipline – the two pillars of professional systems engineering practice in the automotive industry.

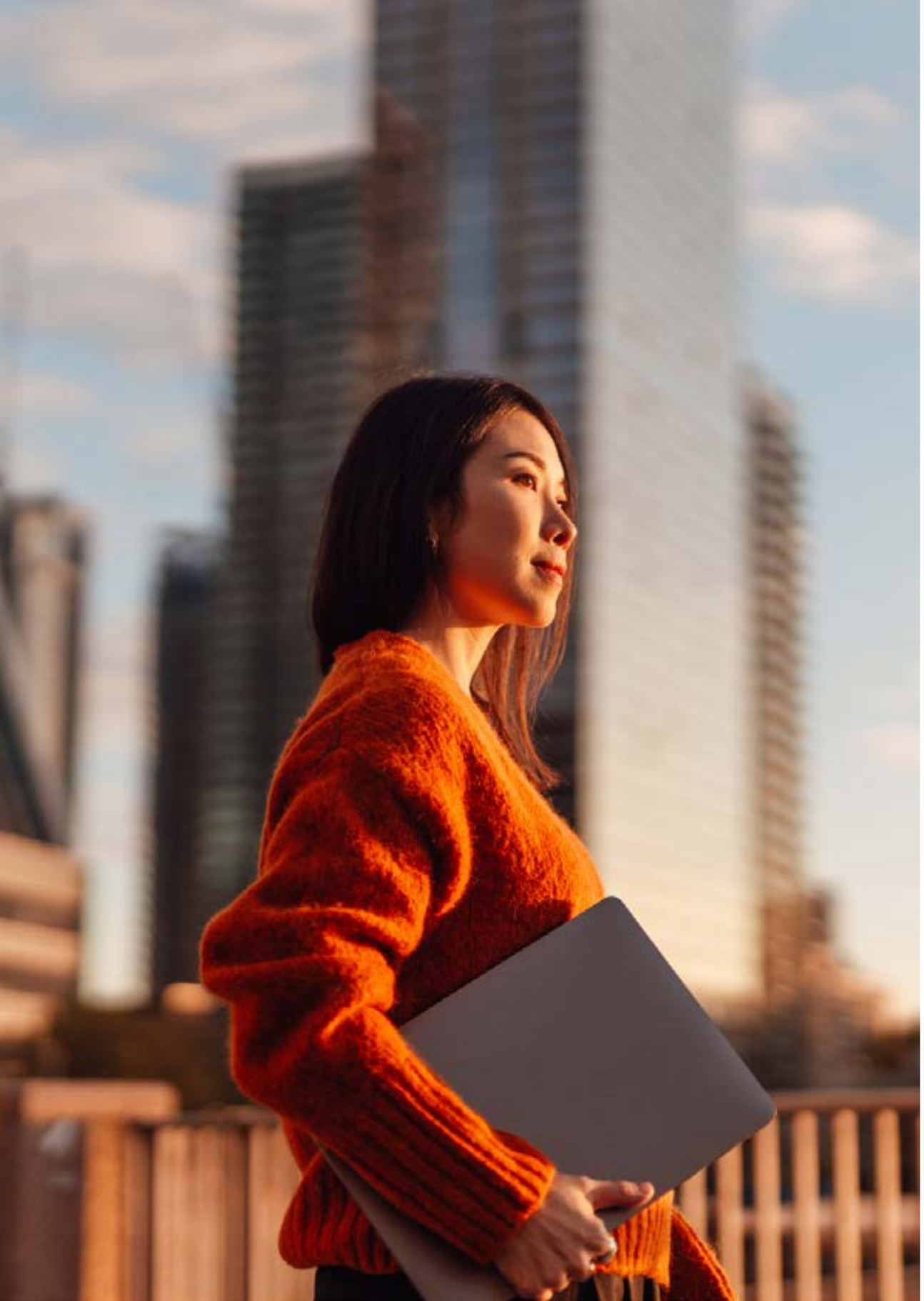
The students will have to develop a theoretical function at system level starting from customer needs continuing with the definition of function specifications and architectural design and ending with system verification and validation. In parallel with the theoretical part students will have the opportunity to compare their progress with practical real world products in our group.

Main Responsabilities

Define and develop functions incrementally, starting from simple, well-understood behaviors and scaling toward complex, interdependent functionalities. Apply the V-Cycle to ensure that every development phase on the left branch (definition & design) has a corresponding verification & validation activity on the right branch Embed Systems Engineering practices (requirements management, interface control, traceability, risk management) at every stage.Establish a reusable and scalable development framework applicable across multiple projects or product lines.

Knowledge Required

Students must have a minimum foundational knowledge in the following areas before starting the project:
-Basic understanding of what a system is (inputs, outputs, functions, interfaces)
-Familiarity with block diagrams and functional decomposition
-Ability to understand technical specifications - standards, norms, data sheets
Nice to have:
-General knowledge of vehicle architecture (chassis, powertrain, electronics)



LGTL Parametrization

Project Description
Students will gain knowledge about LGTL parametrization.In the theoretical approach they will learn about physical movement, forces implied and electrical schematics, our ECU functions and DTCs.
In the practical activities will demonstrate at the garage car a full parametrization activity.

Main Responsabilities
Students should solve proposed objectives:Create a robot to replace human in thermal chamberCreate an AI agent to optimize movement parameters of LGTL after the initial measurements

Knowledge Required
Basic physics and electricity knowledge

Automation with Arduino for controlling auxiliary equipment triggered by climate chambers

Project Description
The project aims to develop an automated and programmable timing system for electrical simulation equipment, using triggers from climate chambers. The main objective is the precise control of the exposure duration of products to specific temperature and humidity conditions.

Main Responsabilities
Developing a time-controlled system using Arduino, configurable through a keypad

Knowledge Required
Electronics development and programming using the Arduino IDE, involving circuit design, component integration, and writing, testing, and optimizing code for reliable system functionality.

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Iasi – the engineering team that gets things done, turning expertise into complete solutions.