SUMMER PRACTICE PROJECTS 2019
IAȘI

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PROCESUL DE SELECȚIE PENTRU PRACTICA DE VARĂ

1. APLICARE:
Completează formularul de aplicare. Te rugăm să menționezi în formularul de aplicare proiectul pentru care dorești să aplici (sau primele 3 proiecte preferate).

2. INTERVIU TEHNIC
În funcție de proiectele alese, vei fi invitat la o discuție tehnică, iar aceasta va fi bazată pe arile tehnice menționate în broșură, la proiectele respective.

3. INTERVIU HR
În urma interviului tehnic, în funcție de feedback-ul primit, vei putea fi invitat în etapa finală, un interviu de grup - o activitate practică.

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TRAFFIC SIGN RECOGNITION USING AI

PROJECT DESCRIPTION
Traffic signs are an integral part of our road infrastructure. They provide critical information, sometimes compelling recommendations, for road users, which in turn requires them to adjust their driving behaviour to make sure they adhere with whatever road regulation currently enforced.

The project’s address students that have both system and software skills, general knowledge about image processing, neural network and Python language. The averall outcame should be concluded in recognizing basic traffic signs based on a set of images provided.

MAIN RESPONSIBILITIES
- Analyze and substract from prior-work the optimal traffic sign recognition method;
- Choose a set of pre-defined requirements for the proposed solution;
- Start implementing the algorithm in Python (or other programming language) for 2 or 3 types of traffic signs;
- Optimize and extend criteria to more traffic sign and scenarios.

KNOWLEDGE MUST HAVE
- Python;
- C++

KNOWLEDGE NICE TO HAVE
- Neural Networks;
- Image Processing.

YOUR WORKING CONTRACT COULD BE:
6h per day

MOTOR CONTROL FOR BLDC

PROJECT DESCRIPTION
Implement a routine in order to command/ control a 3 phased sensored (Hall sensors) brushless DC motor.

MAIN RESPONSIBILITIES
- Implement low-level driver for PWM, ADC, hall sensor read;
- Implement commutation technique to command the motor based on hall sensor information;

Optional: Implement speed controller

KNOWLEDGE MUST HAVE
- Basic electronics;
- Close to medium programming knowledge;
- Microcontrollers (ADC, Timers, interrupts).

KNOWLEDGE NICE TO HAVE
Basic motor knowledge would be an advantage

YOUR WORKING CONTRACT COULD BE:
4h/ 6h/ 8h per day
SMART CAR

PROJECT DESCRIPTION
The project’s goal is to obtain an application that includes both a SW and a HW implementation of a Smart Car.

The SW implementation is supposed to implement an algorithm onto a microcontroller and to develop a smartphone application using an IDE (e.g. Android Studio). The microcontroller algorithm is based on Real Time Operating System (e.g. FreeRTOS, OSEK).

The HW implementation focuses on how to make the connection between the development board and the external peripherals.

The project will use a variety of peripherals like:
- Ultrasonic sensors;
- Camera module;
- Wi-fi module;

The development will consider that the vehicle must be able to work in two main modes: autonomous or controlled through a smartphone.

MAIN RESPONSIBILITIES
- Develop and implement software for embedded devices and systems;
- Interface with hardware design and development.

KNOWLEDGE MUST HAVE
Basics of:
- Electric and Electronic Circuits;
- Electrical Machines.

KNOWLEDGE NICE TO HAVE
- Motor Control;
- MATLAB/ Simulink environment.

YOUR WORKING CONTRACT COULD BE:
6h per day

IMPLEMENTATION OF SCALAR/ TRAPEZOIDAL CONTROL OF BLDC MOTORS IN MATLAB/ SIMULINK SOFTWARE ENVIRONMENT

PROJECT DESCRIPTION
Mathematical Modelling, MATLAB/ Simulink Implementation (Analytical/ SimPowerSystems - Depending on Specific Case) and Simulation of the considered motor control algorithm.

MAIN RESPONSIBILITIES
Documentation on specified topics and Implementation in MATLAB/ Simulink environment of at least one of the motor control algorithms (scalar / trapezoidal) of BLDC motor.

KNOWLEDGE MUST HAVE
Basics of:
- Electric and Electronic Circuits;
- Electrical Machines.

KNOWLEDGE NICE TO HAVE
Basics of:
- Motor Control;
- MATLAB/ Simulink environment.

YOUR WORKING CONTRACT COULD BE:
6h per day
IMPLEMENTATION OF A REALISTIC POWER SEMICONDUCTOR DEVICE (MOSFET) MODEL AND ITS BEHAVIOUR IN MATLAB/SIMULINK SOFTWARE ENVIRONMENT

PROJECT DESCRIPTION
Mathematical Modelling, MATLAB/ Simulink Implementation (Analytical/ SimPow-erSystems - Depending on Specific Case) and Simulation of the realistic power MOSFET model.

MAIN RESPONSIBILITIES
Gain knowledge on specified topics and Implement in MATLAB/ Simulink environment of one realistic controlled semiconductor power electronic device.

KNOWLEDGE MUST HAVE
Basics of:
- Electric and Electronic Circuits.

KNOWLEDGE NICE TO HAVE
Basics of:
- MATLAB/ Simulink environment.

YOUR WORKING CONTRACT COULD BE:
4h per day

IMPLEMENTATION OF A FAULT DETECTION ALGORITHM FOR MOTOR CONTROL SYSTEM IN MATLAB/ SIMULINK SOFTWARE ENVIRONMENT

PROJECT DESCRIPTION
Mathematical Modelling, MATLAB/ Simulink Implementation (Analytical/ SimPow-erSystems - Depending on Specific Case) and Simulation of the considered fault detection algorithm.

MAIN RESPONSIBILITIES
Documentation on specified topics and Implementation in MATLAB/ Simulink environment of at least one fault detection algorithm of a given motor control algorithm for a BLDC motor.

KNOWLEDGE MUST HAVE
Basics of:
- Electric and Electronic Circuits;
- Motor Control.

KNOWLEDGE NICE TO HAVE
Basics of:
- Electrical Machines;
- MATLAB/ Simulink environment.

YOUR WORKING CONTRACT COULD BE:
8h per day
BUILD SPECIFIC OBJECT DIAGRAM FOR A REQUIREMENTS SET USING ENTERPRISE ARCHITECT UML EDITOR

PROJECT DESCRIPTION
The Project proposes to model, into an easy to visualized way, a database of specific Requirements using Enterprise Architect UML Editor.

The outcome of the Project will be an Object Diagram who models the components of a Database, establishing the relations and the hierarchy between them.

MAIN RESPONSIBILITIES
- To query a specific Requirement from a Database;
- To make design and to understand relations between the Objects of a Database;
- To model diverse types of Structural Diagrams using Enterprise Architect UML editor;
- To create an Object Diagram for specific Requirements Database using EA UML editor.

KNOWLEDGE MUST HAVE
- Relational Database knowledge;
- OOP Principles.

KNOWLEDGE NICE TO HAVE
- UML knowledge;
- Enterprise Architect UML tool.

YOUR WORKING CONTRACT COULD BE:
6h per day

SYSTEM CONCEPT DESIGN OF DELIVERY ROBOT FOR CASCADED ROBOT DELIVERY

PROJECT DESCRIPTION
Continental Automotive is taking bold initiatives toward fully automated driving and services based on the newly trends emerged from Mobility as a Service (MaaS) shift of paradigm in transportation, by presenting at CES 2019 tech show the Cascaded Robot Delivery concept based on Continental Urban Mobility Experience (CUbE) platform.

One ambitious challenge of this delivery system is designing completely automated and electric delivery robots capable of carrying small and medium-sized packages on short distances from the CUbE toward private parcels and houses.

This project has the purpose of concept design development of such a robot that can achieve these goals, and, based on the refined concept, to generate the following specific artefacts: operational concept document, system design document, system requirements document and functional/physical architectures.

At the end of the internship period the student should be able to follow and handle an entire system engineering process chain, from concept development towards requirements elicitation and architectural design.

MAIN RESPONSIBILITIES
The internship student will perform the following activities:
- Familiarize with system engineering processes for automated driving by taking a short system engineering training performed by mentors;
- Brainstorm and develop a system concept and design for an automatic and electric robot suited for cascaded delivery;
- Identify from the above and establish the System of Interest, System Context, System Elements, System Missions, System Goals;
- Identify and establish the sets of necessary features, use-cases and scenarios;
- Create based on the above the Operational Concept Document (OCD);
- Elicitation of System Requirements (learn to document the requirements in DOORs or IMS);
- Learn and create the functional and physical architectures (using Microsoft Visio);
- Learn to create the UseCase Diagrams, Activity Diagrams, Black Box and White Box sequence diagrams in Rhapsody;
- Create a Systed Design Description document.
KNOWLEDGE MUST HAVE
- Analytical and abstractization skills;
- Ability to synthesize;
- Basic knowledge of system components (electrical, software, mechanical).

KNOWLEDGE NICE TO HAVE
Basic knowledge of at least one programming language

YOUR WORKING CONTRACT COULD BE:
8h per day

SIMPLIFIED ELECTRONIC BRAKE SYSTEM

PROJECT DESCRIPTION
Through this project we would like to cover the stages of development of an electronic brake system (MCK1 to be used as an example to develop a simplified brake system during the practice period).

As outputs, the students will have to deliver a functional simplified braking system (preassure generation and transmission into an actuator by usage of a hydraulic system as pressure transmission), the related documentation and the presentation of the overall project.

MAIN RESPONSIBILITIES
The project will be split in 2 main activities:
- Learning (basics, systems engineering, tools);
- Building (requirements & architecture definition, develop the system).

KNOWLEDGE MUST HAVE
- Analytical and abstractization skills;
- Ability to synthesize;
- Basic knowledge of system components (electrical, software, mechanical)

KNOWLEDGE NICE TO HAVE
Basic knowledge of at least one programming language

YOUR WORKING CONTRACT COULD BE:
8h per day
DEMONSTRATION OF THE SENSE, PLAN, ACT CHAIN OF EFFECTS WITH AN ARDUINO CONTROLLER

PROJECT DESCRIPTION
Through this project we would like to demonstrate C&S's philosophy that governates the main projects that we develop.

With the use of an Arduino controller, we would like to control an actuator by using an input from a sensor, with the help of a algorithm written in a programming language.

MAIN RESPONSIBILITIES
The project will cover systems engineering topics like concept definition, requirements and architecture development, implementation and testing (the most representative tasks will be detailed due to the time limit of 10 weeks).

KNOWLEDGE MUST HAVE
- Analytical and abstractization skills;
- Ability to synthesize;
- Basic knowledge of system components (electrical, software, mechanical).

KNOWLEDGE NICE TO HAVE
Basic knowledge of at least one programming language

YOUR WORKING CONTRACT COULD BE:
8h per day

ROAD SIGNS RECOGNITION SYSTEM

PROJECT DESCRIPTION
Analysis of informations from images processed from camera with application on automotive systems

MAIN RESPONSIBILITIES
How to create and acquire images, image preprocessing and segmentation (image processing), form recognition methods, object classification, use of image processing information for actuator control.

KNOWLEDGE MUST HAVE
- Analytical and abstractization skills;
- Ability to synthesize;
- Basic knowledge of system components (electrical, software, mechanical).

KNOWLEDGE NICE TO HAVE
Basic knowledge of at least one programming language

YOUR WORKING CONTRACT COULD BE:
8h per day
SENSOR DRIVEN CAR/ AUTOMATED TOY CAR

PROJECT DESCRIPTION
Nowadays, taking into account that the automotive industry is in a continuous development in regards of automated driving assisted by different functions this project will involve a small-scaled toy car which will be programmed to achieve the following purpose: to navigate through a delimited circuit using ultrasonic sensors.

The main purpose of the project is that the students will enjoy learning about Sensorics and Automated Driving from the automotive perspective. The concept of the project can be designed by the students or it may be bought from an online source and the students will only have to assemble the car. The functional concept of this project is based on a programmed MCU which will receive input signals from the sensors and after the info is processed it will tell the car in which direction to go.

Besides the outcome of achieving our main target, the students will get the chance to gain new Software, Hardware, Testing and System Engineering competencies furtheron being able to bring value to the company.

MAIN RESPONSIBILITIES
For the RE part of the project:
- Create requirements that will cover the system’s functionality and design;
- Establish how the system will be created and how it will work from the System Engineering point of view.
For the HW part of the project:
- Assemble all the components of the car together (mechanical, electronical, MCU, sensors, connections).
For the SW part of the project:
- Program the MCU (in a Programming Language or in Block Programming) in order for the car to be able to finish a delimited circuit (example: a labyrinth).
For the Testing part of the project:
- Make sure that the components are working together in the expected parameters;
- Test that the car will do its expected purpose.

KNOWLEDGE MUST HAVE
- Analytical and abstractization skills;
- Ability to synthesize;
- Basic knowledge of system components (electrical, software, mechanical).

KNOWLEDGE NICE TO HAVE
Basic knowledge of at least one programming language

YOUR WORKING CONTRACT COULD BE:
8h per day

VEHICLE MODELLING, SIMULATION AND CONTROL

PROJECT DESCRIPTION
The project is structured in 2 parts - 1st part: modelling of a vehicle and 2nd part: controlling it along a desired path.
Desired outcome for each part: modelling and simulation of a simplified vehicle in continuous time; design, simulation and case study of several control algorithms (including AI driven auto-tuning for control parameters).

MAIN RESPONSIBILITIES
1st part:
- Identify in literature set of ecuations required;
- Model the vehicle (Simulink);
- Simulate behaviour for different scenarios.
2nd part:
- Research several control methods and choose at least 2;
- Implement them (Simulink);
- Implement AI driven methods (genetic algorithms or neural networks) for control parameters auto-tuning.

KNOWLEDGE MUST HAVE
- Basic programming (any language);
- Basic physics and systems theory knowledge.

KNOWLEDGE NICE TO HAVE
1st part:
- System Modelling knowledge/ experience;
- Matlab/ Simulink tool.
2nd part:
- Control Theory knowledge/ experience;
- Matlab/ Simulink tool.
AMBIENT TEMPERATURE CONTROL

PROJECT DESCRIPTION
Develop an embedded system that be able to control ambient temperature in a closed environment (room, vehicle etc).

MAIN RESPONSIBILITIES
- Configure a MCU development kit for signal acquisition (ambient temperature);
- Select and implement a hardware method for reference temperature reading;
- Display the values of interest signals on a LCD display or on a PC;
- Design a PCB that incorporates the above two requirements. Implementing the control algorithm on the final product concept.

KNOWLEDGE MUST HAVE
- Embedded system;
- Digital and analog signal processing;
- Basic electronics (passive and active circuit components, Kirchhoff’s laws);
- Basic C programming skills.

KNOWLEDGE NICE TO HAVE
- Ability to use measuring instruments (oscilloscope), Eagle PCB design (or another similar tool), MATLAB/ Simulink

YOUR WORKING CONTRACT COULD BE:
6h/ 8h per day

SMART HOME USING GSM

PROJECT DESCRIPTION
The aim of this project is to create a way to communicate with different devices from a certain home using text messages and phone calls.

MAIN RESPONSIBILITIES
During the practice period, the student will:
- Learn about AT protocol;
- Use his PC to communicate with a GSM shield via AT protocol;
- Learn how to use/create a development board;
- Implement the communication between development board and GSM shield (via RS-232/I2C/etc.);
- Develop an algorithm that analyze the text messages and phone calls received by the GSM shield, in order to send back statuses (Eg. from temperature sensors) and to control or command different devices (Lamps, fans, boilers, etc).

KNOWLEDGE MUST HAVE
Mandatory:
- Programming basic (basic C);
- Embedded basic;
- Digital and analog signal processing.

KNOWLEDGE NICE TO HAVE
Would be a plus:
- Communication protocols (UART, I2C, AT etc.);
- Electronics basic;
- Real time operating systems.

YOUR WORKING CONTRACT COULD BE:
6h/ 8h per day
**MAGNETIC ROTARY POSITION SENSOR BENCHMARKING**

**PROJECT DESCRIPTION**
Several magnetic sensors, a breadboard some other HW parts for the realization of the circuit will be provided for you. The desired output is a comparison table of performance for several sensors (from different manufacturers).

**MAIN RESPONSIBILITIES**
- Realization of the electronic circuitry;
- Collecting the output data;
- Creation of a comparison matrix.

**KNOWLEDGE MUST HAVE**
General knowledge of electronics

**KNOWLEDGE NICE TO HAVE**
- Data acquisition;
- Matlab.

**YOUR WORKING CONTRACT COULD BE:**
4h/ 6h/ 8h per day

**MONITORING OF A COMMUNICATION BUS LOAD AND AVAILABILITY**

**PROJECT DESCRIPTION**
Monitor a communication bus load under various traffic conditions and maintain a “near real time” status of this load that will be available to other functions on request.

**MAIN RESPONSIBILITIES**
- Learn in-depth about a specific communication protocol and create a dedicated software module - architecture independent;
- The software module should monitor the traffic load and based on predefined values should automatically take some decisions;
- The software module should monitor the traffic load on a communication bus and react to specific external triggers;
- The load status must be available only to specific request from an external function.

**KNOWLEDGE MUST HAVE**
- Programming skills;
- Networking and communication protocols.

**KNOWLEDGE NICE TO HAVE**
- Embedded systems;
- Networking;
- Linux OS.

**YOUR WORKING CONTRACT COULD BE:**
6h per day
MONITORING SYSTEM RESOURCES LOAD: CPU, RAM, STORAGE

PROJECT DESCRIPTION
Monitor the system CPU, RAM and storage load and maintain a “near real time” status of these values.
These values must be made available only at specific request.

MAIN RESPONSIBILITIES
Create a software module that will be able to:
- Read the CPU load;
- Read the RAM load;
- Read the storage load (I/O) and maintain a list with these values. These values must be made available only at specific request.

KNOWLEDGE MUST HAVE
- Embedded systems basic;
- Programming skills;
- Networking and communication protocols.

KNOWLEDGE NICE TO HAVE
- Networking;
- Linux OS.

YOUR WORKING CONTRACT COULD BE:
6h per day

MONITOR THE COMMUNICATION BUS DATA FLOW BASED ON A COMMUNICATION MATRIX

PROJECT DESCRIPTION
Monitor data message flow on a communication bus based on a whitelist approach, ability to rate limit the data messages (e.g. from A to B) and block the data flow based on a communication matrix or external triggers.

MAIN RESPONSIBILITIES
Create a software module that will be able to:
- Use a whitelist for data flow;
- Rate limit the data flow based on predefined values;
- Allow/block a specific data flow;
- Apply the above rules based on external triggers;
- Notify external entity if any restrictive action is applied.

KNOWLEDGE MUST HAVE
- Embedded systems basic;
- Programming skills;
- Networking and communication protocols.

KNOWLEDGE NICE TO HAVE
- Networking;
- Linux OS.

YOUR WORKING CONTRACT COULD BE:
6h per day
INTRUSION PREVENTION/ DETECTION SYSTEM

PROJECT DESCRIPTION
A software module able to identify a specific attack based on predefined triggers and external events.

MAIN RESPONSIBILITIES
Create a software module able to:
- Identify a specific pattern of a predefined attack type;
- Has a specific reaction based on "system logs";
- Apply predefined actions on external triggers from specific entity;
- Notify external entity if specific actions are taken.

KNOWLEDGE MUST HAVE
- Programming skills;
- Networking and communication protocols.

KNOWLEDGE NICE TO HAVE
- Networking;
- Linux OS.

YOUR WORKING CONTRACT COULD BE:
6h per day

RESOURCE CORRELATION BETWEEN SYSTEM CAPABILITIES AND SECURITY MITIGATIONS

PROJECT DESCRIPTION
Correlation between multiple security countermeasures and available system resources under various attack conditions.

MAIN RESPONSIBILITIES
Create a software module able to:
- Identify one or two specific security breaches of the system;
- Take the available system resources (CPU, RAM) and estimate the remaining time until resource exhaust;
- Based on previous info decide what action is the system able to do from a predefined list of actions;
- After the countermeasures are applied verify if the countermeasure is effective or not;
- If the countermeasure is not efficient then put the system to low power mode;
- The system should wake-up from low power mode only if a specific code is applied to external interrupts GPIO's.

KNOWLEDGE MUST HAVE
- Embedded systems;
- Programming skills;
- Networking and communication protocols.

KNOWLEDGE NICE TO HAVE
- Networking;
- Linux OS.

YOUR WORKING CONTRACT COULD BE:
4h per day
SMART TRACKED ROBOT WITH CONNECTIVITY THAT CAN PERFORM SOME SIMPLE TASKS

PROJECT DESCRIPTION
Modular tracked robot, remotely controlled, that can perform different tasks as “cut the grass” (summer) or “remove the snow” (winter).

MAIN RESPONSIBILITIES
Create a software module able to:
- Control the movement of the robot (accelerate, break, turn left, right);
- Control the assigned task (cut the grass/remove the snow);
- Wireless control of the robot;
- Ability to view images of the installed camera;
- Monitor parameters about the load of the robots (power consumption, engine rotation, etc) - optional;
- Detect (some) obstacles and react to them - optional;
- Asamble the required mechanical components/parts.

KNOWLEDGE MUST HAVE
- Embedded systems basic;
- Programming skills;
- Networking and communication protocols;
- Basic electronics.

KNOWLEDGE NICE TO HAVE
- Embedded systems;
- Networking;
- Linux OS.

YOUR WORKING CONTRACT COULD BE:
6h per day

SMART TRACKED ROBOT WITH CONNECTIVITY THAT CAN PERFORM SOME SIMPLE TASKS

PROJECT DESCRIPTION
Modular tracked robot, remotely controlled, that can perform different tasks:
- Cut the grass (summer);
- Remove the snow (winter).

MAIN RESPONSIBILITIES
The students should make an analysis to motivate the used/required/selected electronic components:
- The engine power;
- Requirements for the battery;
- Other calculations (electrical design and worst case calculation, functional safety analysis).

KNOWLEDGE MUST HAVE
- Embedded systems basic;
- Basic electronics.

KNOWLEDGE NICE TO HAVE
- Embedded systems;
- Advanced electronics.

YOUR WORKING CONTRACT COULD BE:
6h per day
OBJECT RECOGNITION SYSTEM

PROJECT DESCRIPTION
Using a Raspberry Pi 3 platform, that includes an on-board 8Mpx camera and running a custom developed image processing algorithm able to detect and recognize objects, you need to implement an object recognition system using specific image processing libraries.

MAIN RESPONSIBILITIES
Your main tasks will include:
- Learn about image processing algorithms used in object recognition;
- Identify and propose two approaches that can be used to implement an object recognition algorithm using image processing;
- Implement the proposed approaches;
- Make an comparison study regarding the accuracy, recognition rate, uncertainty and processing time.

KNOWLEDGE MUST HAVE
- Basic electronics;
- C/C++ programming;
- Python.

KNOWLEDGE NICE TO HAVE
- Image processing;
- Linux OS;
- Open CV.

YOUR WORKING CONTRACT COULD BE:
4h per day

DATA TRANSFER VIA CAN PROTOCOL

PROJECT DESCRIPTION
Implement a CAN data transfer between two embedded systems. In order to transfer custom acquired data a library of configurable functions used to program embedded systems linked by a CAN bus.

An optional feature could be a set of functions used to configure and acquire data from analog or digital channels.

MAIN RESPONSIBILITIES
Your main tasks will include the following:
- Design the hardware to connect the two embedded systems using the CAN bus;
- Implement a library of software functions used to configure and allow the embedded systems to transfer data using CAN communication protocol;
- An optional development consist in a set of functions used to configure and acquire data from analog and digital channels;
- Integrate HW and SW into a working system.

KNOWLEDGE MUST HAVE
- Basic electronics;
- Microcontrollers;
- C/C++ programming.

KNOWLEDGE NICE TO HAVE
- CAN bus

YOUR WORKING CONTRACT COULD BE:
4h per day
PARALLEL DATA ACQUISITION SYSTEM

PROJECT DESCRIPTION
Implement a parallel data acquisition system that communicates the data to a PC for visualization, storage and processing.

The system shall be capable to acquire data from analog or digital channels.

The system will be based on a HW platform controlled using a ARM microprocessor and will acquire data and transfer it to a host computer.

MAIN RESPONSIBILITIES
Your main tasks will include the following:
- Learn about the hardware capabilities of the two available HW platforms;
- Propose and design a solution for the HW component of the system;
- Design the SW architecture of the acquisition system;
- Implement the necessary functions in order to: configure the acquisition process, locally store acquired data, transfer data to a remote device (data socket, PC, data base);
- Implement an user interface to facilitate visualization, storage and processing of acquired data.

KNOWLEDGE MUST HAVE
- Basic electronics;
- Microcontrollers;
- C/C++ programming.

KNOWLEDGE NICE TO HAVE
- Data acquisition;
- Signal processing.

YOUR WORKING CONTRACT COULD BE:
4h per day

TEMPERATURE CONTROL SYSTEM

PROJECT DESCRIPTION
Implement a embedded system that is used to control the temperature inside a closed chamber. The system shall be able to measure the temperature in multiple points inside a closed chamber and regulate the temperature to a user preseted value by controlling an Peltier element and two fans.

MAIN RESPONSIBILITIES
Your main tasks will include the following:
- Design the hardware architecture of the system;
- Create schematic and PCB design needed to connect all hardware components (dev kit, sensors, fans, etc.);
- Develop the software that acquires data from sensors, reads the preset temperature and controls the fans;
- Integrate HW and SW into the a working system.

KNOWLEDGE MUST HAVE
- Basic electronics;
- Microcontrollers;
- C/C++ programming.

KNOWLEDGE NICE TO HAVE
PCB layout design

YOUR WORKING CONTRACT COULD BE:
4h per day
SPECTRUM ANALYZER

PROJECT DESCRIPTION
Develop a spectrum analyzer in the MHz range, with advanced post-processing features (FFT, noise pattern detection), to be used for increasing knowledge in EMI noise areas and deeper analysis of circuit issues.

MAIN RESPONSIBILITIES
- Select and configure a MCU/DSP development kit for signal acquisition;
- Select or develop an analog front-end for signal acquisition;
- Display the acquired data (on a PC or on a dedicated display);
- Implement the signal processing algorithms (code generation with Simulink would be a plus).

KNOWLEDGE MUST HAVE
- MCU/ DSP programming, and usage of analog peripherals, data acquisition;
- Digital signal processing;
- Basic analog circuit analysis (basic electronics, amplifiers, dividers).

KNOWLEDGE NICE TO HAVE
- MATLAB/ Simulink;
- Advanced analog circuits (filters, instrumentation amplifiers, high-frequency circuit design).

YOUR WORKING CONTRACT COULD BE:
6h/ 8h per day

INTERCONNECTION BETWEEN STM32 FAMILY MICROCONTROLLERS AND ANDROID DRIVEN SMARTPHONES

PROJECT DESCRIPTION
The student should know at the end of the program what is a microcontroller, what are his uses, to understand the Android environment, to write code; to take advantage of the possibilities the Android environment; to be capable to use the specific tools, ide-s and computer languages in order to establish the communication between a smartphone and the STM32F family microcontroller.

MAIN RESPONSIBILITIES
- To make his own research on the theme;
- To dig deeper in the knowledge of C and Java programming languages;
- Write code/ debug;
- Make constant efforts and commit himself/ herself to the task;
- To come up (when possible) with his/her own solutions to specific problems.

KNOWLEDGE MUST HAVE
- C;
- Java.

KNOWLEDGE NICE TO HAVE
- Android development;
- Event driven systems;
- OOP concepts;
- Basic electronic knowledge.

YOUR WORKING CONTRACT COULD BE:
8h per day
DRONE

PROJECT DESCRIPTION
A drone based on BLDC motors driven by ESCs and controlled by development board with GPS and accelerometer/gyroscope for redundant positioning.

MAIN RESPONSIBILITIES
- Order parts;
- Develop hardware and software;
- Testing;

KNOWLEDGE MUST HAVE
- Electronics;
- Programming.

KNOWLEDGE NICE TO HAVE
Testing knowledge.

YOUR WORKING CONTRACT COULD BE:
4h per day
LABORATORY TOOL INVENTORY

PROJECT DESCRIPTION
Laboratory tool inventory is a tool that comes in and identifies the status of the tool and to whom it has been borrowed. The fixed station will perform the scanning of the tools and identification badges.

MAIN RESPONSIBILITIES
- Gain knowledge of microcontrollers, selecting the proper microcontroller for the solution;
- Gain knowledge of radio communications - RFID;
- Better understanding protocols and information transmission;
- Create block diagram of Hardware and Software;
- Simulate, develop and test the individual parts of block diagram, both HW and SW;
- Develop the Hardware part of the application;
- User Interface Design;
- Develop the Software part of the application;
- Calibration of the solution.

KNOWLEDGE MUST HAVE
- Electronics knowledge (Diode, Transistor, passive components, filters, operational amplifiers);
- ANSI C programming (Variable types, WHILE loop, FOR, SWITCH, IF/ELSE).

KNOWLEDGE NICE TO HAVE
- User Interface Design

YOUR WORKING CONTRACT COULD BE:
8h per day

MULTI-PURPOSE LAB BENCH TOOL

PROJECT DESCRIPTION
Research and Development in the electronic industry requires special tools such as DMM (Digital Multi-Meter), Soldering Iron and Power Supply. Basically, most of the actions such as assembling and testing of the electronic devices require these instruments.

The main goal of this project is to obtain an integrated device that contains a basic Multi-Meter, Soldering Iron with temperature controller and variable Power Supply.

MAIN RESPONSIBILITIES
- Gain knowledge of microcontrollers, selecting the proper microcontroller for the solution;
- Gain knowledge of Power supplies, Soldering stations and Digital Multi-Meters;
- Create block diagram of Hardware and Software;
- Simulate, develop and test the individual parts of block diagram, both HW and SW;
- Develop the Hardware part of the application;
- Develop the Embedded Software part of the application;
- Calibration of the solution;
- Test the solution;
- Documentation of the solution.

KNOWLEDGE MUST HAVE
- Electronics knowledge (Diode, Transistor, passive components, filters, operational amplifiers);
- ANSI C programming (Variable types, WHILE loop, FOR, SWITCH, IF/ELSE).

KNOWLEDGE NICE TO HAVE
- Layout Design

YOUR WORKING CONTRACT COULD BE:
6h per day
**NOISE DETECTOR FOR OFFICE**

**PROJECT DESCRIPTION**
Ad-hoc meetings, visits or phone meetings in the office can create noise for the other colleagues and this may decrease their productivity or personal comfort.

A noise detector could be a useful device for keeping the noise level at a decent level. A small, battery powered device would be the approach for this situation taking also into consideration the benefit of this solution, portability.

**MAIN RESPONSIBILITIES**
- Gain knowledge of microcontrollers, selecting the proper microcontroller for the solution;
- Better understanding Audio signals;
- Create block diagram of Hardware and Software;
- Simulate, develop and test the individual parts of block diagram, both HW and SW;
- Develop the Hardware part of the application;
- Develop the Software part of the application;
- Calibration of the solution;
- Test the solution;
- Documentation of the solution.

**KNOWLEDGE MUST HAVE**
- Electronics knowledge (Diode, Transistor, passive components, filters, operational amplifiers);
- ANSI C programming (Variable types, WHILE loop, FOR, SWITCH, IF/ELSE).

**KNOWLEDGE NICE TO HAVE**
- Layout Design

**YOUR WORKING CONTRACT COULD BE:**
8h per day

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**STOCK MONITOR**

**PROJECT DESCRIPTION**
The main goal of this project is to develop the means of tracking the quantity of components from R&D stock. The deliverables will consist in a hardware device and a software package.

The hardware part can be a Raspberry Pi and the software package can be hosted on this device.

**MAIN RESPONSIBILITIES**
- Gain knowledge of microcontrollers/ microcomputers, selecting the proper microcontroller/ microcomputer for the solution;
- Better understanding protocols and information transmission;
- Create block diagram of Hardware and Software;
- Simulate, develop and test the individual parts of block diagram, both HW and SW;
- Develop the Hardware part of the application;
- User Interface Design;
- Develop the Software part of the application;
- Test the solution;
- Documentation of the solution.

**KNOWLEDGE MUST HAVE**
- Electronics knowledge (Diode, Transistor, passive components, filters, operational amplifiers);
- ANSI C programming (Variable types, WHILE loop, FOR, SWITCH, IF/ELSE).

**KNOWLEDGE NICE TO HAVE**
- Layout Design

**YOUR WORKING CONTRACT COULD BE:**
8h per day
LIGHTSHOW ON LARGE BUILDINGS USING IOT (INTERNET OF THINGS) TECHNOLOGY

PROJECT DESCRIPTION
An electronic device capable to display an information using a matrix made with addressable LEDs.

Additional, should be capable of interfacing with similar devices.

MAIN RESPONSIBILITIES
- Getting familiar with the HW and SW components that will be used in the project;
- Simulate the project in a software application;
- Create the hardware component for the addressable LEDs;
- Interface with pycom platform;
- Develop the software to control the light cells;
- Document each step of the project;
- Prepare a presentation at the end of the project.

KNOWLEDGE MUST HAVE
- Electronics knowledge (Diode, Transistor, passive components, filters, operational amplifiers);
- ANSI C programming (Variable types, WHILE loop, FOR, SWITCH, IF/ELSE).

KNOWLEDGE NICE TO HAVE
IoT - pycom platform

YOUR WORKING CONTRACT COULD BE:
8h per day

CAN MODULE FOR ANALOGUE MONITORING WITHIN AUTOMATED TESTING SYSTEMS

PROJECT DESCRIPTION
The goal of the project is to develop a CAN module for analogue monitoring within automated testing systems by using microcontroller platforms.

The project consists of several satellites and a gateway which interconnects all the existing satellites, although each of the satellites is capable of monitoring analogue signals (E.g. temperature, voltage, current) within the system.

MAIN RESPONSIBILITIES
- Learning the microcontroller architectures;
- Reading documentation regarding methods of temperature monitoring;
- Developing the sensor satellite software layer for acquiring the temperature;
- Developing the gateway software layer for processing the entire data cluster obtained from the satellites;
- Developing the software layer for the CAN communication between sensor satellites and gateway.

KNOWLEDGE MUST HAVE
- Basic-Intermediate knowledge regarding integrated circuits;
- Basic-Intermediate knowledge understanding electrical schematics;
- Basic-Intermediate knowledge understanding the functionality of Analog-to-Digital/Digital-to-Analog converters;
- Basic-Intermediate knowledge understanding the process of data acquisition;
- Good programming knowledge (e.g. C embedded, C#, LabVIEW)

KNOWLEDGE NICE TO HAVE
Layout Design

YOUR WORKING CONTRACT COULD BE:
8h per day
PLUGIN DEVELOPMENT FOR EMBEDDED SW CODE GENERATION

PROJECT DESCRIPTION
Develop plugins for embedded SW C code generation integrated into an existing toolchain.

The plugins will be written in Java and it will allow the configuration of a basic software C module with a fixed part and a configurable part.

The configurable part will be defined using dedicated graphical user form.

MAIN RESPONSIBILITIES
- Learn and understand the principle for basic software modules for product platform;
- Develop and test a plugin in Java for generation and configuration of a module;
- Document the development workflow, document usage of the plugin

KNOWLEDGE MUST HAVE
- Java;
- C;
- XML.

KNOWLEDGE NICE TO HAVE
Embedded C

YOUR WORKING CONTRACT COULD BE:
4h per day

DATA BASE WITH A COLLECTION OF UNUSUAL TESTCASES AND AUTOMATION IN CAPL/PYTHON

PROJECT DESCRIPTION
Develop a data base with a collection of unusual testcases happen in Door Control Unit project. Implement an user friendly data base to fast get test scenario and contribute to automatize them.

MAIN RESPONSIBILITIES
Learn and understand the principle for a database for test case collection and corner test case concept; develop the data base, automate tescases in CAPL / CANoe/ Python.

KNOWLEDGE MUST HAVE
- Scripting;
- Database;
- C.

KNOWLEDGE NICE TO HAVE
Embedded C

YOUR WORKING CONTRACT COULD BE:
8h per day
CHANGE MANAGEMENT AND PLANNING DATABASE HANDLING (JIRA, MPP, IMS, EXCEL) WITH PYTHON

PROJECT DESCRIPTION
Develop scripts for change management and planning database handling using python. Develop exporters importers tools between IMS, JIRA, MPP and Excel.

MAIN RESPONSIBILITIES
- Learn and understand the principle for handling JIRA, IMS, Excel, MPP via various APIs;
- Develop scripts for various import / export / planning topics.

KNOWLEDGE MUST HAVE
- Scripting;
- Database;
- C.

KNOWLEDGE NICE TO HAVE
Embedded C

YOUR WORKING CONTRACT COULD BE:
4h per day

QUIZ GAME FOR EMBEDDED PROGRAMMING KNOWLEDGE

PROJECT DESCRIPTION
Develop a game based on the idea of Conquitzador and DiceWars in order to involve colleagues in competition of embedded programming knowledge.

A data base with questions will be used to challenge the colleagues. A WEB user interface and a game engine have to be developed

MAIN RESPONSIBILITIES
- Game playable by colleagues;
- Quiz database;
- Game engine and user interface.

KNOWLEDGE MUST HAVE
- Web applications.
- database.
- .NET / Java.

KNOWLEDGE NICE TO HAVE
Embedded C

YOUR WORKING CONTRACT COULD BE:
4h per day
GENERIC CAPL SCRIPTS FOR MAIN DIAGNOSIS TOPICS IN AUTOMOTIVE (FLASHING, END-OF-LINE) AS ALTERNATIVE TO COMMERCIAL DIAGNOSTIC TOOLS FOR CONTINUOUS INTEGRATION

PROJECT DESCRIPTION
Develop CAPL scripts for main Diagnosis topics in Automotive as flashing, end-of-line, in order to support the development team with quick and robust solutions able to run on in a continuous integration environment.

The solutions provided should be generic and configurable in order to be ported on various customer project.

MAIN RESPONSIBILITIES
- Learn and understand the principle for Automotive Diagnostics;
- Implement scripts for flashing and end-of-line, make the scripts generic on various customers.

KNOWLEDGE MUST HAVE
- C;
- Scripting.

KNOWLEDGE NICE TO HAVE
Embedded C

YOUR WORKING CONTRACT COULD BE:
8h per day

ROBOTIC ARM CONTROLLED USING COMPUTER VISION

PROJECT DESCRIPTION
Create a system that can identify an object, grab it and move it.

MAIN RESPONSIBILITIES
- Build the system;
- Create the arm control SW;
- Using computer vision frameworks, train the system to detect the required objects;
- Integrate the computer vision SW, the arm SW and Create the control algorithm.

KNOWLEDGE MUST HAVE
- C/C++;
- Python;
- Linux.

KNOWLEDGE NICE TO HAVE
Hardware

YOUR WORKING CONTRACT COULD BE:
8h per day
CAR DATA SHARING - BCM

PROJECT DESCRIPTION
A complete set of requirements for setting a communication between cars.
Focus on BCM functions:
- Autonomous driving (automatic cruise control, etc);
- Lights (brake, hazard, fog lights, etc);
- Diagnosis (car and driver diagnosis).

MAIN RESPONSIBILITIES
Research and write specifications for communication and function systems between cars.
For any of the themes chosen, the student should:
- Document at least one important aspect (security, communication car-to-car, vulnerabilities of technology to be considered, specific technical limitations, specific technical innovation proposals);
- Structure the documented topics in a set of SYSTEM requirements (to be derived in software, hardware, safety relevant or not requirements);
- Set-up a set of test cases to be considered mainly on system testing level;
- Design a sample ECU (2 ECUs for demonstrating car-to-car communication) which should cover (hw and/or software) the topic documented;
- Assistance from continental team will be provided in documentation process, hw design and sw implementation for sample;
- SW – to be implemented on Autosar with embedded C;
- Sw can be also modelled in Mathlab (assistance from Continental team).

KNOWLEDGE MUST HAVE
- Analytical, creative, research, perseverance, passionate;
- Basic embedded programming, basic algorithm.

YOUR WORKING CONTRACT COULD BE:
8h per day

CAR DATA SHARING - GATEWAY

PROJECT DESCRIPTION
A complete set of system requirements for setting a communication between cars.
Focus on BCM function gateway:
- centralize data collection and spread to other cars,
- interface with other modules: infotainment, (telematics, multimedia, navigation), engine control, etc.

MAIN RESPONSIBILITIES
Research and write specifications for communication and function systems between cars.
For any of the themes chosen, the student should:
- Document at least one important aspect (security, communication car-to-car, vulnerabilities of technology to be considered, specific technical limitations, specific technical innovation proposals);
- Structure the documented topics in a set of SYSTEM requirements (to be derived in software, hardware, safety relevant or not requirements);
- Set-up a set of test cases to be considered mainly on system testing level;
- Design a sample ECU (2 ECUs for demonstrating car-to-car communication) which should cover (hw and/or software) the topic documented;
- Assistance from continental team will be provided in documentation process, hw design and sw implementation for sample;
- SW – to be implemented on Autosar with embedded C;
- Sw can be also modelled in Matlab (assistance from Continental team).

KNOWLEDGE MUST HAVE
- Analytical, creative, research, perseverance, passionate;
- Basic embedded programming, basic algorithm.

YOUR WORKING CONTRACT COULD BE:
8h per day
TRAFFIC SIGN RECOGNITION SYSTEM USING RASPBERRY PI

PROJECT DESCRIPTION
This project will focus on demonstration of the ability of image processing on a small computing platform.

It consists of two parts: development of an efficient image recognition system (using Raspberry Pi and Python), and manipulation of data (results) which need to be transmitted through ethernet to a PC App.

MAIN RESPONSIBILITIES
Develop a python app on Raspberry Pi board, which captures the images taken by camera, process them using a machine learning framework in order to achieve a correct traffic sign recognition.

Also, the student needs to develop a PC app and to transmit data between raspberry pi and pc using Ethernet. In the whole development process, the student also needs to write documentation.

KNOWLEDGE MUST HAVE
- Python;
- Machine Learning;
- OOP;
- Linux;
- C#.

YOUR WORKING CONTRACT COULD BE:
6h per day

SWT METRICS AND REPORTING TOOL

PROJECT DESCRIPTION
Create a tool (python scripts) in order to generate metrics and reports for requirements / SW tests for a BCM project.

MAIN RESPONSIBILITIES
- Become familiar with python language, DOORS and IMS;
- Analyse requirements/tests exports in order to gain the idea how to create the python scripts;
- Create scripts in python to generate metrics for each project module, for:
  - Requirements (coverage percentage, which requirements are covered with test cases in work, list all requirements that are not covered - depending on Release, Safety level, maturity);
  - Software tests (metrics based on test cases maturity and test cases automatization, final report for validation phase);
- Create documentation for the scripts (a presentation).

KNOWLEDGE MUST HAVE
High Level Programming

YOUR WORKING CONTRACT COULD BE:
8h per day
CONTROL A SIMULATED CAR CORE USING RASPBERRY PI, PYTHON AND C++

PROJECT DESCRIPTION
This project will simulate various functionalities from a car and be able to help in development, testing and experiments with a low cost and easy integration. Python and C++ are two of the most common and fun programming languages offering simplicity and power. With Raspberry Pi as a host, all the preconditions for a fun project are set.

MAIN RESPONSIBILITIES
- Learn Python, C++;
- Follow our coding standards and develop the application.

KNOWLEDGE MUST HAVE
- Good programming understanding;
- Any of the languages: C++, Python.

YOUR WORKING CONTRACT COULD BE:
6h per day
TOOL FOR LOGGING THE HOURS SPENT IN THE COMPANY

PROJECT DESCRIPTION
Currently we are using excel files for log the hours. We would like to have a tool that automates most of the process for the logging hours: the date and hour of arrival and leaving.

Fill in the reasons why the employee stayed more than 8 hours per day.

Perform statistics of the recorded hours. It should have a GUI and a database for storage.

MAIN RESPONSIBILITIES
Develop the tool for the logging of the hours.

KNOWLEDGE MUST HAVE
- Database;
- Any GUI language;
- OOP language.

YOUR WORKING CONTRACT COULD BE:
4h/ 6h/ 8h per day

HIRING TOOL

PROJECT DESCRIPTION
Develop with colleagues from Continental an application that should manage the hiring process

MAIN RESPONSIBILITIES
Manage in a friendly UI the entire flow of hiring process.

Work together with the Continental team in different areas: database, UI, algorithms.

KNOWLEDGE MUST HAVE
- C++;
- SQL;
- QT.

YOUR WORKING CONTRACT COULD BE:
4h/ 6h/ 8h per day
GLOBAL ANALYZER

PROJECT DESCRIPTION
Develop with colleagues from Continental an application that is managing logs and traces from various inputs and projects and is able to analyze.

MAIN RESPONSIBILITIES
The end result should be an app that is able to understand any kind of input, from any kind of projects, written in any way and still be able to analyze and provide pre-analysis. Work together with the Continental team in different areas: plugins, UI, algorithms.

KNOWLEDGE MUST HAVE
- C++;
- Algorithms;
- Qt;
- Artificial Intelligence.

YOUR WORKING CONTRACT COULD BE:
4h/ 6h/ 8h per day

LOCATION SPACE MANAGEMENT GENERATOR

PROJECT DESCRIPTION
Develop a stand-alone or web app that is generating solutions for people/teams allocation in a building/offices or meeting rooms.

MAIN RESPONSIBILITIES
- Improve the meeting room scheduler. First step would be to implement a mechanism to check if the meeting that was schedule really took place and what meetings are deprecated;
- Improve the estimations and planning for office allocation. For this the input would be a building office space and respectively the teams. The tool should generate different solutions for allocation and pointing out pros/cons of each solution;
- Develop (with support) the algorithms for the tool. C++;
- Creat a the UI for the application using QT and qmls.

KNOWLEDGE MUST HAVE
- C++/Java;
- QT, Algorithms.

YOUR WORKING CONTRACT COULD BE:
4h/ 6h/ 8h per day
NAVIGATION CENTRAL INVENTORY (NCI)

PROJECT DESCRIPTION
The project aims to create/maintain a SQL Database and provide an user-friendly interface for a dynamic DB fill/update.

The main application core is in place, the network communication works.
Remaining action items:
- Create remaining tables in the database;
- Send emails to users within the application;
- Generate .xlsx reports from the application;
- Fix existing bugs.

MAIN RESPONSIBILITIES
Develop the tool for the central inventory.

KNOWLEDGE MUST HAVE
- Basic C#;
- Basic OOP;
- Basic SQL.

YOUR WORKING CONTRACT COULD BE:
4h/ 6h/ 8h per day

PLANNING POKER++

PROJECT DESCRIPTION
An Agile planning session? Let the planning poker begin!

The aim of this project is to develop an server-client application for planning poker.

The server shall be able to:
- Inform all the clients regarding the ticket for which the estimation shall be done;
- Receive all estimations from the clients;
- Specify the lowest, the highest estimation and the clients that gave them;
- Receive re-estimations from all clients;
- Calculate the average;
- Store the estimation.

The client shall be an Android application and is able to:
- Receive from the server the ticket number discussed;
- Select an estimation from a deck with Fibonacci numbers;
- Send the estimation to the server;
- Be informed regarding being the lowest/highest estimation;
- Store notes introduced by the user for the ticket discussed;
- Send re-estimation to the server;
- Store the estimation.

MAIN RESPONSIBILITIES
Develop the application.

KNOWLEDGE MUST HAVE
- OOP;
- C++.

KNOWLEDGE NICE TO HAVE
Android

YOUR WORKING CONTRACT COULD BE:
4h/ 6h/ 8h per day
CROSS PLATFORM HMI INSIDE ANDROID OPERATING SYSTEM

PROJECT DESCRIPTION
The aim of the project is to develop an application for the Android Operating System using cross platform technologies (C/C++, OpenGL).

This will help Continental investigate the possibility of code reuse for GUI applications between different operating systems and platforms.

MAIN RESPONSIBILITIES
- Implement a minimal OpenGL 2D rendering engine;
- Implement a minimal resource manager;
- Implement a minimal widget system;
- Implement an input management system.

KNOWLEDGE MUST HAVE
- OOP;
- C/ C++.

KNOWLEDGE NICE TO HAVE
- Linear algebra;
- Operating Systems;
- Java - basic.

YOUR WORKING CONTRACT COULD BE:
6h/ 8h per day

NAVIGATION USING SPEECH RECOGNITION

PROJECT DESCRIPTION
As a driver, I would like to start navigation by speech recognition so that I can focus my attention completely to driving.

This project aims to develop a navigation feature. The user is able to give commands related to navigation (destination, route) and the selection is visible on the map.

MAIN RESPONSIBILITIES
Develop the application.

KNOWLEDGE MUST HAVE
- OOP;
- C++.

YOUR WORKING CONTRACT COULD BE:
6h/ 8h per day
EMOTION DETECTION USING SPEECH

PROJECT DESCRIPTION
Recognize the following emotions by analyzing speech: happiness, fear, anger, sadness, disgust.

MAIN RESPONSIBILITIES
An application that takes voice as input and recognizes one of the specified emotions.

Develop an application that gets the input from the microphone, analyzes the samples and states probabilities for the emotion being one of the specified ones. Project may be based on components developed in HMI Speech 2.0.

KNOWLEDGE MUST HAVE
- OOP;
- C++;
- (optional) signal analysis.

KNOWLEDGE NICE TO HAVE
- Speech recognition;
- Voice analysis;
- Advanced C++ knowledge;
- Design patterns.

YOUR WORKING CONTRACT COULD BE:
6h/ 8h per day

ANDROID APPLICATION FOR CONTINUOUS INTEGRATION

PROJECT DESCRIPTION
This project aims to create an application in Android for continuous integration. The user is able to connect to a Jenkins server using this application, start/stop/monitor builds, visualize KPIs.

MAIN RESPONSIBILITIES
Develop the application.

KNOWLEDGE MUST HAVE
- OOP;
- Python.

YOUR WORKING CONTRACT COULD BE:
6h/ 8h per day
**REVIEW STATISTICS ANALYZER**

**PROJECT DESCRIPTION**
The purpose of this project is to create a Python GUI application that is able to retrieve informations from the code reviews and generate various reports based on the retrieved information.

Examples of statistics needed: solved/unsolved defects per each patch, reviewers and their contribution, duration for a review per a patch.

**MAIN RESPONSIBILITIES**
Develop the application.

**KNOWLEDGE MUST HAVE**
- OOP;
- Python.

**YOUR WORKING CONTRACT COULD BE:**
6h/ 8h per day

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**ASSISTED SELF-DRIVING CAR**

**PROJECT DESCRIPTION**
Create an assisted self-driving car controlled by speech commands. The car shall be able to autonomously move around the office, avoid obstacles, act according to the received commands. It shall be controlled via an Android application able to recognize voice commands.

**MAIN RESPONSIBILITIES**
Develop the application.

**KNOWLEDGE MUST HAVE**
- OOP;
- C++

**YOUR WORKING CONTRACT COULD BE:**
6h/ 8h per day
MAKE2CMAKE

PROJECT DESCRIPTION
The application takes as input makefiles and generates as output the corresponding CMakeLists files.

MAIN RESPONSIBILITIES
Develop the application.

KNOWLEDGE MUST HAVE
- OOP.

YOUR WORKING CONTRACT COULD BE:
6h/8h per day

TV SERIES SUGGESTION ANDROID APP

PROJECT DESCRIPTION
In the future of a fully self-driving car, how will the drivers spend their time?

This project aims to address this question by suggesting the driver some TV series that (s)he might like. Taking as input the driver’s preferences regarding TV series, the application is able to suggest other TV series (s)he might like.

The application shall also be able to do self-updates with new shows based on imdb API.

MAIN RESPONSIBILITIES
Develop the application.

KNOWLEDGE MUST HAVE
- OOP.

YOUR WORKING CONTRACT COULD BE:
6h/8h per day
CAPACITY ALLOCATION PLANNING SERVICE (CAPS)

PROJECT DESCRIPTION
We want to develop a web-based application (Client-Server) that will be able to count for allocated persons on all projects and calculate costs while respecting demand and budget.

MAIN RESPONSIBILITIES
Build a Python application, synchronized with Microsoft’s Active Directory that holds behind it an Oracle Database and fulfills the functions of the excel, adding:
- Concurrent user access;
- Live warning in case of over allocation of one person;
- Project capacity limiter with warning of over drafting;
- Customizable reports;
- E-mail integration of reports available in pdf / excel format;
- Integration of multiple costs and spending data;
- Direct integration with SAP through RFC functions;
- No more crashes and errors in data sync, the application infrastructure being client-server;
- Automated mail notifications when a project need has decreased or increased to the responsible departments;
- Jira report integration to match personnel allocation to skills and planned stories for PI planning validation.

KNOWLEDGE MUST HAVE
- OOP;
- Linux Development;
- MySQL;
- OOP; Java/Python.

KNOWLEDGE NICE TO HAVE
Bootstrap

YOUR WORKING CONTRACT COULD BE:
6h per day

AUTOMATIC ISSUE DETECTION (AID)

PROJECT DESCRIPTION
Developers analyze software problems based on text traces. It is common that during development phase, traces for sporadic issues are not enough to detect the root cause and developers need to reproduce the problem (manually or during overnight tests). This operation consumes long periods of developer’s time. In addition, when a problem is easily reproducible on our device farm, Jira tickets are cut for every occurrence of the issue. Thus, we end up with multiple tickets that will be duplicated but this will cost increased amounts of time on the developers’ side.

Because we want our developers to focus on solving real issues, we want to have a web-based application that detects if issues reproduced overnight are already existing as tickets in Jira. If yes attaches the new traces to give developer more context.

MAIN RESPONSIBILITIES
- Collect and store all the logs resulted from our device farm during test-case execution in a database;
- Allow introduction and storage of “trace patterns” for bugs though the front end;
- Performs automatic searches in the database based on “trace patterns” (Elastic search);
- Be integrated with Jira ticketing system;
- In case a problem is reproduced during tests, instead of creating a new ticket, an occurrence counter is increased for the Jira ticket and the responsible developer is notified by email.

KNOWLEDGE MUST HAVE
- OOP;
- Linux Development;
- Java/Python;
- MySQL;
- Basic Scripting Knowledge.

KNOWLEDGE NICE TO HAVE
Elastic Search
AWS, Kubernetes
Jenkins, Jira
YOUR WORKING CONTRACT COULD BE:
6h per day

Q MONITOR - SW COMPONENT MATURITY EVALUATION

PROJECT DESCRIPTION
Important information about the software components of our project are stored with each release inside a mySQL DB in a Kubernetes cluster. Some of them are part of Grafana dashboards.

We would like to integrate multiple pieces of existing information for one component in a Grafana visualization so that a component maturity/risk can be identified.

The Goal is to create a way for our managers and engineers to easily evaluate risks and maturity of our components.

MAIN RESPONSIBILITIES
Implement the following functionalities and display them in Grafana for a specific or multiple SW components (time period can also be adjustable):
- How many requirements changed in the last 6 months;
- How many git commits were made in the last 6 months;
- How large is the code size;
- How many lines of Code change in the last 6 months;
- How many open bugs are linked to a SW Component;
- How many bugs were solved, duplicated, rejected, what severities and their distribution during different periods of time.

KNOWLEDGE MUST HAVE
- OOP;
- Java/Python;
- MySQL;
- Basic Scripting Knowledge.

KNOWLEDGE NICE TO HAVE
- Kubernetes;
- Git;
- Jenkins;
- Jira.

YOUR WORKING CONTRACT COULD BE:
6h per day

Q MONITOR - SW TESTS MATURITY AND RELIABILITY EVALUATION

PROJECT DESCRIPTION
Our platform is fully relying on automated tests to insure quality. This means that our test cases are vital to the maturity of our product. We need a way to assess the maturity and reliability of the test-cases themselves.

MAIN RESPONSIBILITIES
Research metrics for maturity and reliability of test cases:
- One of the potential metrics is called “flakiness” – measuring if a test intermittently fails and is a waste a time;
- Another is how long a test case needs to run. Or how many test steps it has.

These metrics need to be collected and shown via our Grafana QMonitor in a useful way. Significant information is available in a mySQL database.

KNOWLEDGE MUST HAVE
- SQL knowledge;
- Basic scripting knowledge.

KNOWLEDGE NICE TO HAVE
- Jenkins;
- Advanced scripting Knowledge.

YOUR WORKING CONTRACT COULD BE:
6h per day
CONTINUOUS DELIVERY PIPELINE IMPROVEMENTS

PROJECT DESCRIPTION
Our project applies a Continuous Delivery Pipeline to integrate, verify and deploy SW changes of Automotive products. The pipeline is implemented through Jenkins jobs managed by a Jenkins master controlling the execution of tasks on slaves.

Multiple slaves are already in place but need to be managed as underlying infrastructure and product requirements change.

MAIN RESPONSIBILITIES
Using virtualization techniques (e.g. docker), a deployment mechanism must be developed in a manner that pipeline changes affecting the Jenkins slaves are automatically deployed on new or existing slaves.

KNOWLEDGE MUST HAVE
- Linux development;
- Jenkins or other continuous integration tools;
- Programming experience (e.g., in Python or Ruby).

KNOWLEDGE NICE TO HAVE
Tools for virtualization (e.g.: Docker, Ansible and Vagrant, etc)

YOUR WORKING CONTRACT COULD BE:
6h per day

JIRA REPORTER

PROJECT DESCRIPTION
Implement Jira Reports using Python. Integrate these reports into “Python Web Portal” (Conti internal tool).

MAIN RESPONSIBILITIES
Develop Jira reports using Python.

KNOWLEDGE MUST HAVE
Python

KNOWLEDGE NICE TO HAVE
- PHP;
- HTML;
- MySql;
- Javascript.

YOUR WORKING CONTRACT COULD BE:
6h/8h per day
**PYHON WEB PORTAL ENHANCEMENTS**

**PROJECT DESCRIPTION**
Enhance the existing “Pyhon Web Portal” Conti internal tool.

**MAIN RESPONSIBILITIES**
Implement new features for “Pyhon Web Portal” Conti internal tool.

**KNOWLEDGE MUST HAVE**
- PHP;
- HTML;
- MySql;
- Javascript.

**KNOWLEDGE NICE TO HAVE**
Python

**YOUR WORKING CONTRACT COULD BE:**
6h/8h per day

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**WEB INVENTORY MANAGER**

**PROJECT DESCRIPTION**
Implement a web portal to allow inventory management for the hardware resources used internally by Continental.

**MAIN RESPONSIBILITIES**
Implement a new web portal that will allow you to:
- Add/Edit/Delete Items from inventory;
- Search inventory;
- Export search results into excel.

**KNOWLEDGE MUST HAVE**
- PHP;
- HTML;
- MySql;
- Javascript.

**YOUR WORKING CONTRACT COULD BE:**
6h/8h per day
OVERTIME RECORDING APP

PROJECT DESCRIPTION
Add new features to Overtime recording application (analyze records, create statistics, etc.)

MAIN RESPONSIBILITIES
Extend functionality of existing Overtime recording Web application.

KNOWLEDGE MUST HAVE
- HTML;
- PHP;
- MySql - basic (not mandatory)
- Knowledge acquired by the student at the end of the project: Improve HTML, PHP, MySql knowledge.

YOUR WORKING CONTRACT COULD BE:
6h/8h per day

CHECK EXISTING PROBLEM REPORTS (CEPR)

PROJECT DESCRIPTION
Enhance existing Conti internal Web tool CEPR.

MAIN RESPONSIBILITIES
Enhance existing Conti internal Web tool CEPR.

KNOWLEDGE MUST HAVE
- HTML;
- PHP;
- MySql - Basic (not mandatory);
- Knowledge acquired by the student at the end of the project: Improve HTML, PHP, MySql knowledge.

YOUR WORKING CONTRACT COULD BE:
6h/ 8h per day
AVOID DUPLICATE PROBLEM REPORTS (AVDPRS)

**PROJECT DESCRIPTION**
AVDPRs is an existing Conti internal tool that allows you to analyze application traces against a known errors database and report duplicates.

**MAIN RESPONSIBILITIES**
Enhance existing Conti internal AVDPRs tool.

**KNOWLEDGE MUST HAVE**
- Javascript;
- Python;
- Mysql

**YOUR WORKING CONTRACT COULD BE:**
6h/8h per day

VEHICLE LOCATOR AND REMOTE CONTROL (VRLC)

**PROJECT DESCRIPTION**
VLRC is a development board used for vehicles tracking and remote control (programmed start/stop, engine parameters monitoring), ignition lock and telematics.

**MAIN RESPONSIBILITIES**
Development board: Schematic, PCB layout, software, electrical tests.

**KNOWLEDGE MUST HAVE**
Analog and digital design, GSM, GPS, microcontrollers, layout, C language

**YOUR WORKING CONTRACT COULD BE:**
8h per day

RHAPSODY2UML

**PROJECT DESCRIPTION**
Rhapsody is a tool provided by IBM. UML diagrams may be created in this tool and are stored in .sbs files. This project seeks to find a way to parse .sbs files and convert them to regular UML.

**MAIN RESPONSIBILITIES**
Develop the application.

**KNOWLEDGE MUST HAVE**
OOP
C++

**YOUR WORKING CONTRACT COULD BE:**
6h/8h per day
PUMP CONTROL SOFTWARE APPLICATION ON A S12ZVML128 CONTROLLER

PROJECT DESCRIPTION
Develop a SW application in order to control a Diesel or Gasoline pump.

MAIN RESPONSIBILITIES
- Develop SW application;
- Test application on given HW samples;
- Debug and document results.

KNOWLEDGE MUST HAVE
- C programming;
- Microcontroller Architecture.

KNOWLEDGE NICE TO HAVE
Basic Electronics

YOUR WORKING CONTRACT COULD BE:
4h per day
ROOM ATTENDANCE DETECTION WITH RFID OR KEYPAD

PROJECT DESCRIPTION
The main purpose of this project is to allow the participant of a laboratory to sign in by using an access card or a keypad access code. This eliminates the need for a traditional attendance sheet and can allow the teacher a direct access to the attendance lists.

The project includes work in different areas: Microcontrollers, Software and Database Programming.

MAIN RESPONSIBILITIES
- Create an system that allows easy sign in;
- Create a SW to parse information received/transmitted from/to the database;
- Create the database.

KNOWLEDGE MUST HAVE
- Basic C/ ANSI C;
- Basic Database knowledge.

KNOWLEDGE NICE TO HAVE
Basic Microcontroller knowledge.

YOUR WORKING CONTRACT COULD BE:
4h/ 6h/ 8h per day

NFC DOOR LOCK

PROJECT DESCRIPTION
Have you ever wanted to unlock your front door with just your smartphone, bus pass, a tag, or an old hotel room key?

The idea of this project is to create a modern security system that will allow you to do all of the things mentioned above with NFC technology.

MAIN RESPONSIBILITIES
- Understand what security really means;
- Create fictional testing door system;
- Create a NFC SW system capable to control the fictional door.

KNOWLEDGE MUST HAVE
- Basic C/ ANSI C;
- Basic Database knowledge;
- Basic web technologies as an alternative for low level C language.

KNOWLEDGE NICE TO HAVE
- Basic Microcontroller knowledge;
- Basic JS and/or Node.JS;
- Basic HTML, CSS.

YOUR WORKING CONTRACT COULD BE:
4h/ 6h/ 8h per day
HOME LIGHTING CONTROL SYSTEM

PROJECT DESCRIPTION
The aim of the project is to connect a variety of home lighting systems, such as LED stripes, lamps, and to successfully gain the capabilities to control them via an android app.

The first part will consist into the introduction in the basic Android development, and the second part will consist in pairing the app with the slave microcontroller and the other modules.

The communication between the app and the rest of the systems will be made using Bluetooth modules.

MAIN RESPONSIBILITIES
- User database;
- Login on the app via token;
- Create SW for the communication;
- In case everything has been checked, we can try connecting even other devices, and depending on the location from the house, certain devices to be working (ex. speakers).

KNOWLEDGE MUST HAVE
- C/ ANSI C

KNOWLEDGE NICE TO HAVE
- Knowledge about Python/Java;
- Knowledge about Android development;
- Knowledge about Bluetooth modules;
- Knowledge about microcontroller.

YOUR WORKING CONTRACT COULD BE:
4h/ 6h/ 8h per day

GESTURE MUSIC PLAYER

PROJECT DESCRIPTION
This project aims to create a gesture controlled music player. The user should be able to change the volume level, change the track and pause/play.

The project include work in the areas of Software Development and Microcontrollers.

MAIN RESPONSIBILITIES
- Create a motion recognition software;
- Implement the interaction with a music player;
- Create the hardware;

KNOWLEDGE MUST HAVE
- Basic C/ ANSI C;
- Basic Arduino knowledge.

KNOWLEDGE NICE TO HAVE
Basic Microcontroller knowledge.

YOUR WORKING CONTRACT COULD BE:
4h/ 6h/ 8h per day
CAR PARKING MONITORING SYSTEM WITH CLL SW 2.1 PLATFORM

PROJECT DESCRIPTION
The purpose of the project is to monitor a parking lot with spaces available or not, based on sensors and to display the numbers of available spots in the parking lot on the LCD.

If there are no more spaces left, a gate will be commanded and will close the parking lot. This requires knowledge of C embedded, microcontrollers.

MAIN RESPONSIBILITIES
- Working with microcontrollers;
- Working with LCDs;
- Working with sensors;
- Working with DC motors;
- Test the application.

KNOWLEDGE MUST HAVE
- Basic C/ ANSI C;
- Basic Microcontroller knowledge.

KNOWLEDGE NICE TO HAVE
- Basic electronics;
- Platform studied for CLL SW 2.1.

YOUR WORKING CONTRACT COULD BE:
4h/ 6h/ 8h per day

COLLISION AVOIDANCE SYSTEM - BRAKE ASSISTANT

PROJECT DESCRIPTION
The purpose of this project is to implement a collision avoidance system which can be found on many cars as a safety mechanism. The desired outcome is a working prototype of the braking system.

MAIN RESPONSIBILITIES
- Control the braking prototype by taking into account the input from a distance sensor;
- The project will be developed in C;
- To simulate the braking system, a DC motor shall be controlled.

KNOWLEDGE MUST HAVE
Basic C/ANSI C;

KNOWLEDGE NICE TO HAVE
- Basic electronics;
- Basic Microcontroller knowledge.

YOUR WORKING CONTRACT COULD BE:
4h/ 6h/ 8h per day
**X AND O WITH GLCD AND CAN**

**PROJECT DESCRIPTION**
In the context of the project, the participant will have to use two Infineon application Kit boards with touchscreen LCD to create a CAN network in which the users can play a X&O game.

**MAIN RESPONSIBILITIES**
- Create the SW for receiving/transmitting from one board to another;
- Create the interface for the LCD;
- Configure CAN network;

**KNOWLEDGE MUST HAVE**
- Basic C/ ANSI C;
- Basic Microcontroller knowledge.

**KNOWLEDGE NICE TO HAVE**
- CAN network knowledge

**YOUR WORKING CONTRACT COULD BE:**
4h/ 6h/ 8h per day

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**ENGINEERING WIZARD**

**PROJECT DESCRIPTION**
Test environment prototype under 1500 Euro

**MAIN RESPONSIBILITIES**
- dSPACE simulator documentation analysis
- Hardware analysis and development
- Software analysis and development
- Testing

**KNOWLEDGE MUST HAVE**
Motivation

**KNOWLEDGE NICE TO HAVE**
- Self study;
- Hardware knowledge;
- Software knowledge.

**YOUR WORKING CONTRACT COULD BE:**
4h per day
IMPLEMENT CAN FD PROTOCOL FOR SW REPROGRAMMING IN AUTOMOTIVE

PROJECT DESCRIPTION
- Implement CAN FD protocol on top of existing CAN reprogramming tool;
- Add support for flashing .s19 files;
- Improve tool RAM usage;
- Increase compatibility with Windows 10;
- Validation on HEV Projects supporting CAN FD.

MAIN RESPONSIBILITIES
- Analyze feature requirements;
- Understand CAN FD protocol;
- Understand and use UDS protocol;
- Validate UDS reprogramming on CAN FD;
- Understand reprogramming strategy in Automotive.

KNOWLEDGE MUST HAVE
- OOP programming: C++/ C#;
- Basic C/ ANSI C.

KNOWLEDGE NICE TO HAVE
- Basic Microcontroller knowledge;
- Basic CAN/ CAN FD knowledge.

YOUR WORKING CONTRACT COULD BE:
8h per day

SMART SOFTWARE TEST AUTOMATION WITH JENKINS

PROJECT DESCRIPTION
Software test automation using Jenkins jobs and Python scripts, git-based, time-based.

MAIN RESPONSIBILITIES
Develop new Python scripts;
Configure new Jenkins jobs;
Run Jenkins jobs and XML testcases;
Create reports.

KNOWLEDGE MUST HAVE
Python scripting

KNOWLEDGE NICE TO HAVE
- SW Development know-how;
- SW Test Automation principles;
- Jenkins.

YOUR WORKING CONTRACT COULD BE:
8h per day
TOOL SUPPORT AND SCRIPT DEVELOPMENT FOR SOFTWARE IN HEV. INTELLIGENT KNOWLEDGE DATABASE

PROJECT DESCRIPTION
Tool support and script development for Software Development in HEV. Contribute to development of an Intelligent knowledge database.

MAIN RESPONSIBILITIES
Support users from HEV Iasi department to maintain, install and configure applications and develop scripts for the development platform.

Develop knowledge database.

KNOWLEDGE MUST HAVE
- Attitude, enthusiastic, multitasking skills;
- English;
- Basic knowledge in programming.

KNOWLEDGE NICE TO HAVE
- Self study;
- Software knowledge.

YOUR WORKING CONTRACT COULD BE:
8h per day

IMPLEMENT SMART HOME CONTROL APPLICATION WITH CLL SW 2.1 PLATFORM

PROJECT DESCRIPTION
Implement smart home control application that uses:
- Temperature sensor;
- Gas sensor;
- Proximity sensor;
- Low voltage relees;
- Control of DC motor back electromotive force method.

MAIN RESPONSIBILITIES
- Implement single wired communication for temperature sensor;
- Configure uC peripherals;
- Implement interpolation map for gas sensor.

KNOWLEDGE MUST HAVE
- Basic C/ ANSI C;
- Basic Microcontroller knowledge.

KNOWLEDGE NICE TO HAVE
- Self study;
- Hardware knowledge;
- Software knowledge;
- Platform studied for CLL SW 2.1.

YOUR WORKING CONTRACT COULD BE:
8h per day
INTERNAL UBER FOR CONTINENTAL IASI EMPLOYEES

PROJECT DESCRIPTION
Goal is to develop a mobile application for Android, IOS to allow Continental Employees to track the colleagues with a car and ask for a ride and the colleagues with a car to see request for rides from other pedestrian colleagues.

MAIN RESPONSIBILITIES
A functioning application for many OS, that will perform as an UBER but only for Continental Employees in Iasi.

KNOWLEDGE MUST HAVE
- OOP;
- Basic knowledge about working with maps and libraries;
- Basic SW development for mobile applications.

KNOWLEDGE NICE TO HAVE
- Android SW development;
- IOS SW development;
- Knowledge about calculation of distances and times using maps.

YOUR WORKING CONTRACT COULD BE:
4h per day

A REAL KEYLESS ENTRY

PROJECT DESCRIPTION
Goal is to build a better keyless entry system using the users smartphone instead of a standard key.

MAIN RESPONSIBILITIES
A functioning application for Android, that will start the car when user gets close to it.

KNOWLEDGE MUST HAVE
- Basic knowledge of OOP;
- Basic knowledge of JAVA.

KNOWLEDGE NICE TO HAVE
- Android SW development;
- In-depth understanding of wireless protocols (e.g. Bluetooth);
- In-depth understanding of a car’s ignition system.

YOUR WORKING CONTRACT COULD BE:
8h per day
WIRELESS CONTROL OF AN RELAY WITH THE HELP OF AN ANDROID BASED PLATFORM

PROJECT DESCRIPTION
Goal is to develop a product that is able to command an relay over the internet.

MAIN RESPONSIBILITIES
The expected result is to have the system build and functional.

KNOWLEDGE MUST HAVE
- Basic hardware knowledge;
- Basic knowledge of ANSI C.

KNOWLEDGE NICE TO HAVE
- SYS design;
- Microcontrollers architecture and programming;
- Web server site building;
- Android development platform knowledge.

YOUR WORKING CONTRACT COULD BE:
6h/ 8h per day

AGILE/CI CONNECTORS DEVELOPMENT

PROJECT DESCRIPTION
Connect Agile tools: Git/Github, Jira, Collaborator, MKS, Artefactory etc.

MAIN RESPONSIBILITIES
- Create interfaces between tools;
- Import data from tools to other tools;
- Continuous integration scripts and automatization.

KNOWLEDGE MUST HAVE
- Java;
- Python;
- Batch;
- C#.

KNOWLEDGE NICE TO HAVE
- Agile tools knowledge (github, git, Jira, collaborator etc);
- Scripting skills.

YOUR WORKING CONTRACT COULD BE:
8h per day
JENKINS CONTINUOUS INTEGRATION

PROJECT DESCRIPTION
Jenkins Farm maintenance and script development

MAIN RESPONSIBILITIES
Maintenance and development of Jenkins infrastructure.

KNOWLEDGE MUST HAVE
Scripting.

KNOWLEDGE NICE TO HAVE
- scripting in different languages;
- build automation;
- Jenkins master-slave infrastructure;
- Jenkins plugin development;
- git (gerrit, github), Jira, Smartbear code collaborator.

YOUR WORKING CONTRACT COULD BE:
8h per day

MINI-ROVER CONTROLLED VIA WI-FI/BLUETOOTH

PROJECT DESCRIPTION
The goal is to control a Mini-Rover by using Bluetooth or Wi-Fi.

MAIN RESPONSIBILITIES
The student should be able to develop a complete system which allows the user to control the speed and direction of a vehicle remotely.

KNOWLEDGE MUST HAVE
- C/ C++ programming;
- Motor control (basic);
- Communication protocols.

KNOWLEDGE NICE TO HAVE
- Android development tools;
- Motor control principles;
- Ability to develop a system from design to implementation;
- C/ C++ Programming Skills.

YOUR WORKING CONTRACT COULD BE:
4h/ 6h/ 8h per day
COMMUNICATION PROTOCOL ROUTER

PROJECT DESCRIPTION
The behavior should be similar to a gateway. A message should come with a certain ID, but should be sent on a different ID.

The idea behind is to create a routing table which would allow the tool to know on which ID the data should be routed on.

MAIN RESPONSIBILITIES
Desktop Application which should be able to read the CAN bus and based on the routing table should be able to route the CAN message on a different ID.

KNOWLEDGE MUST HAVE
- C/ C++;
- Programming.

KNOWLEDGE NICE TO HAVE
- Automotive communication protocols knowledge;
- SW Design principles.

YOUR WORKING CONTRACT COULD BE:
4h/ 6h/ 8h per day

REVERSE PENDULUM

PROJECT DESCRIPTION
Develop a two wheel robot, controlled based on a phone’s accelerometer which keeps its balance while moving.

The communication with the smartphone should be done via bluetooth or wi-fi.

MAIN RESPONSIBILITIES
A self-balancing robot which is able to move but still keep its balance through a control algorithm which is implemented.

KNOWLEDGE MUST HAVE
C

KNOWLEDGE NICE TO HAVE
- Control algorithms
- SW design
- Microcontroller peripheral know-how

YOUR WORKING CONTRACT COULD BE:
4h/ 6h/ 8h per day
**XLS TO XML CONVERTER**

**PROJECT DESCRIPTION**
The goal is to create an app which is able to place the content from an excel file into a xml predefined template.

**MAIN RESPONSIBILITIES**
A tool which is able to convert from xls to a format used in Automotive projects.

**KNOWLEDGE MUST HAVE**
C/C++

**KNOWLEDGE NICE TO HAVE**
- SW Design Principles,
- Automotive file standards,
- Automotive tooling knowledge.

**YOUR WORKING CONTRACT COULD BE:**
4h/ 6h/ 8h per day

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**INTEGRATE A CAN ENHANCEMENT INTO A REPROGRAMMING TOOL**

**PROJECT DESCRIPTION**
CAN-FD is an improvement of the CAN standard. Such improvement is needed in reprogramming tools.

This feature is used mostly by the customer when reprogramming a product.

**MAIN RESPONSIBILITIES**
- Integration of 3rd party libraries;
- Offer the possibility to switch the GUI from normal CAN to CAN FD.

**KNOWLEDGE MUST HAVE**
- C/C++;
- Communication protocols;
- Microcontrollers.

**KNOWLEDGE NICE TO HAVE**
- Automotive communication protocols knowledge;
- SW Design principles;
- Flash memory handling.

**YOUR WORKING CONTRACT COULD BE:**
4h/ 6h/ 8h per day
UNIVERSAL CALIBRATION PROTOCOL FOR REPROGRAMMING TOOLS

PROJECT DESCRIPTION
Enhance the possibility to reprogram a car electronic unit via universal calibration protocol used for high-speed and big data load.

MAIN RESPONSIBILITIES
A tool which is able to interpret the data sent via CAN according to the protocol implementation.

KNOWLEDGE MUST HAVE
- C/C++;
- Communication protocols.

KNOWLEDGE NICE TO HAVE
- Automotive communication protocols;
- SW Design Principles;
- Flash memory handling.

YOUR WORKING CONTRACT COULD BE:
4h/ 6h/ 8h per day