Continental

The Future in Motion

SUMMER PRACTICE PROJECTS 2020 TIMIȘOARA

LET YOUR IDEAS SHAPE THE FUTURE

PROCESUL DE SELECŢIE PENTRU PRACTICA DE VARĂ

1. APLICARE:
Aplică cu CV în limba engleză şi o scrisoare de intenţie, menţionând programul pentru care aplici şi proiectele dorite.

2. INTERVIU TEHNIC
Preinterviu telefonic şi/sau teste de personalitate şi tehnice (poţi alege unul sau mai multe teste tehnice, cum ar fi: ANSI C, microcontrolere, Java, C++, LAbView, Matlab/Simulink, hardware, mecanică sau IT).

3. INTERVIU HR

CÂND?	CE?
1 februarie 2020	Postarea proiectelor de practică
1 februarie – 26 martie 2020	Selecţia de CV-uri
24 februarie – 10 aprilie 2020	Testări tehnice
1 aprilie – 16 aprilie 2020	Interviuri HR
7 mai – 15 iunie 2020	Interviuri tehnice
1 iunie – 1 iulie 2020	Rezultatele finale sunt comunicate candidaţilor
iulie – septembrie 2020	Stagiile de practică

PROJECTS

CONTENTS

SOFTWARE

CAN TRACE PARSING TOOL

PROJECT DESCRIPTION

In the context of development of an instrument cluster and testing, there is bus traffic over a CAN bus with diagnosis or testing commands. The object of the project is to take a trace of the CAN bus transactions and automatically interpret key elements from that file (a .txt file, for example).
Features could include:
- Inline commenting of trace lines
- Trace filtering
- Linking to reference documents
- Detecting reference communication protocol
- Error filtering

TECHNICAL KNOWLEDGE

- C
- C++
- Java

TESTS
- C
- C++
- Java

NR. OF STUDENTS
1

COACH
Stefan Sanatescu

DIAGNOSTIC FILE PARSING TOOL

PROJECT DESCRIPTION

In the context of development of an instrument cluster and testing, there are transactions with the cluster that involve uploading software content into the microcontrollers of the cluster. Part of the files that are uploaded is content which is called "metadata", which is not a part of the binary content that is uploaded, but is used by the tools to correctly identify the file and link it to the framework.

The object of the project is to create a GUI and parsing mechanism in order to show this "metadata" to regular users of tools that need the files.

Features could include:
- Multiple format support
- Format detection
- GUI for showing metadata
- GUI for modifying particular elements of medatada

TECHNICAL KNOWLEDGE
- C
- C++
- Java

TESTS
- C
- C++
- Java

NR. OF STUDENTS
1

COACH
Stefan Sanatescu

EMULATION OF SERIAL PROTOCOLS

PROJECT DESCRIPTION

In the context of testing an instrument cluster, part of the testing routines involves use of communication protocols to interact with other devices or microchips outside the host microcontroller, on the instrument cluster's board.

In order to simplify testing mechanisms and add more options to the testing routine portfolio, as well as reacting faster to requests, emulating the serial communication protocols is an option. When configuring a new microcontroller peripheral does not work during development, communication can be swapped to "emulation mode" and the testing can continue, while configuration issues are resolved in parallel.

Features could include:
- Emulation of I2C
- Emulation of SPI
- Emulation of UART
- Emulation of LIN
- Emulation of special serial protocols

TECHNICAL KNOWLEDGE
- C
- Java
- C#

TESTS
- C
- microcontrollere

NR. OF STUDENTS
1

COACH
Stefan Sanatescu

SW TEST FRAMEWORK EXTENSION

PROJECT DESCRIPTION

Creation/extension of generic test case libraries (C based) for common automotive SW functions such as: Diagnostics, Communication, Error Handling, Cyber Security. Extension and optimization of existing Python tools from the SW Test Framework toolchain.

TECHNICAL KNOWLEDGE
- C
- Python

TESTS
- ANSI C
- C++
- Java

NR. OF STUDENTS
2

COACH
Mihaela Vitalariu
Andrei Radac

DEMO APPLICATION FOR AN EMBEDDED LINUX PLATFORM

PROJECT DESCRIPTION

Our group is responsible with creating a modern platform that offers various services for our application developers such as:
- Bluetooth
- Wi-fi
- GPS
- GSM/3G
- Touchscreen
- USB Connection

We want to develop a demo application to showcase the various functionalities that our platform has to offer. During your summer practice, you will learn to use the APIs to use the technologies mentioned above and you will be part of the development effort for this brand new demo app.

TECHNICAL KNOWLEDGE

- C++
- Java
- Embedded would be a plus
- Linux would be a plus

TESTS

- C++
- Java

NR. OF STUDENTS

2

COACH

Muresan Dragos

VITALQIP 8 PROJECT

PROJECT DESCRIPTION

Support the Corporate Network and Voice team during the rollout of the new DNS/DHCP/IP Address Management solution and new feature set.

TECHNICAL KNOWLEDGE

- Networking
- Software Installation
- Windows 10 OS
- Linux

TESTS

- C++
- C#
- Java
- IT

NR. OF STUDENTS

1

COACH

Florin Gonciulea

EHORIZON PREVIEW CHECK TOOL

PROJECT DESCRIPTION

For state-of-the art eHorizon project we want to enhance our automated testing tools to enable us testing the complex ADASIS V2.0.2 protocol.

Application will be implemented in C or C++ and will implement based on a given CAN logfile a test tool that finds protocol deviations from the ADASIS v 2.0.2 specification.

Tool shall be callable by command line and GUI.

TECHNICAL KNOWLEDGE

- Good C
- C++ or Java
- Knowledge of GUI (QT or similar) would be a plus

TESTS

- ANSI C
- C++
- C#
- Java
- Microcontrollers

NR. OF STUDENTS

2

COACH

Remus Gusa

CANOE COMMUNICATIONS CONFIGURATION

PROJECT DESCRIPTION

Develop CANoe configuration for BCM Integration purposes with the following goals:
- All signals can be changed by panel;
- Integrate Diag Status information in a CANoe based status panel;
- Maintain and adapt configuration according to immediate needs.

TECHNICAL KNOWLEDGE

- ANSI C - advanced
- CAN knowledge – basic
- LIN knowledge – basic

TESTS

- Ansi C
- Embedded SW/ Microcontrollers

NR. OF STUDENTS

1

COACH

Dorin Ogner

CANOE: AQUISITION&PROCESSING OF HW I/O'S USING VECTOR VN(1630A/1640A) AND BUS FRAMES EMISSION CONTROL USING NODES&PANELS

PROJECT DESCRIPTION
Design panels in CANoe tool based on specific requirements received from coordinator.
The panels will be used to send and receive messages from CAN database.

Build HW setup to acquire a HW I/O from a Vector VN(1630A/1640A) and process the information in code (capl).

The CAN database will be available.

TECHNICAL KNOWLEDGE
- Medium programming skills
- Basic electronics knowledge

TESTS
- ANSI C
- Microcontrollers
- Hardware

NR. OF STUDENTS
3

COACH
Silvia-Iulia Pana
Cristea Cristian

SHOW PARAMETER VALUE OR TEST STEP DESCRIPTION WHEN YOU CLICK ON DD NAME IN DOORS

PROJECT DESCRIPTION
Show the parameter value or the test step description defined in DD document in test specification when the mouse cursor is on the name.
In this case the review and manual test execution will be easier.

TECHNICAL KNOWLEDGE
- Programing skills
- Python knowledge is a plus

TESTS
- Java
- C#
- C++

NR. OF STUDENTS
1

COACH
Ionut Popescu
Cristea Cristian

DYNAMIC GRAPH VISUALIZATION OF THE BASE SOFTWARE ARCHITECTURE IN AN INSTRUMENT CLUSTER PROJECT

PROJECT DESCRIPTION
Develop a PC software tool (C#) which generates a graphical overview of the embedded software architecture for an instrument cluster base software project. The tool will use as input configuration files (pseudo language format) of the base software modules.
Main tasks:
- Understand software architecture of an instrument cluster base software project;
- Parse input files and store useful information in internal data structures;
- Develop a PC tool which is using existing library for graphs representation to visualize in a dynamic way details about software architecture.

TECHNICAL KNOWLEDGE
- ANSI C
- Embedded systems / Microcontrollers

TESTS
- ANSI C
- Microcontrollers
- C#

NR. OF STUDENTS
1

COACH
Cristian Paunescu

INSTRUMENT CLUSTER BLUETOOTH CONNECTIVITY

PROJECT DESCRIPTION
In touch with new trends for instrument clusters connectivity requirements, develop Android / IOS based mobile application and embedded software that allows BlueTooth communication between mobile and vehicle instrument cluster.

Main tasks:
- Get to know the Bluetooth internal communication protocol and what a device needs to implement to allow others to connect via Bluetooth;
- Develop mobile application that would send and receive data via Bluetooth;
- Understand how a realtime operating system works and develop embedded software modules in ANSI C to communicate with the smartphone;
- Exchange data between devices to support on instrument cluster side features like: display notifications (e.g social media, missed calls), accept / decline calls, activate / deactivate smartphone voice control, multimedia handling (e.g music volume and track control), display turn-by-turn navigation; mobile app can support reading of vehicle information (e.g vehicle speed, traveled distance).

TECHNICAL KNOWLEDGE
- ANSI C
- Embedded systems / Microcontrollers
- Mobile App development

TESTS
- ANSI C
- Microcontrollers

NR. OF STUDENTS
1

COACH
Cristian Paunescu

NEAR FIELD COMMUNICATION (NFC) FUNCTIONS DEMONSTRATOR

PROJECT DESCRIPTION
The purpose of this project is to define and implement together with the team a prototype which can be used to demonstrate NFC functions possible inside a vehicle:
- Secure Access and Start of the car using a smartphone. Communication channel between car and smartphone is NFC and this should be secure;
- Bluetooth and WiFi pairing via NFC;
- Android Beam functions (transmission of multimedia content from phone to car via NFC);

The phases of the summer practice project are:
- Definition of the concept (use case scenarios, data flow, communication channels);
- Implementation of Car simulator on a PC;
- Implementation of a smartphone application;
- Implementation of the software on embedded hardware.

TECHNICAL KNOWLEDGE
- C
- Microcontroller
- Java knowledge
- C# knowledge
- Android development experience and web application servers (eg Apache Tomcat) knowledge are a plus

TESTS
- ANSI C
- Microcontrollers

NR. OF STUDENTS
1

COACH
Orbu Alexandra
Trif Simona

AUTOMATED HIL ENVIRONMENT FOR ACCESS FUNCTION SW

PROJECT DESCRIPTION
The target of the project is to develop test scripts for HIL (Hardware In the Loop) test environment for embedded systems, specific to Remote Keyless Entry and Passive Start and Entry function.

The following steps shall be followed:
- Learning the script language;
- Learning car access software;
- Learning test techniques;
Implementation of various tests for car access generic SW components

TECHNICAL KNOWLEDGE
- C
- Optional: microcontrollers, SW testing techniques

TESTS
- ANSI C
- Microcontrollers

NR. OF STUDENTS
2

COACH
Trif Simona

CONTROL AN ELECTRICAL ENGINE TO REACH A CERTAIN SIMULATED VEHICLE SPEED

PROJECT DESCRIPTION
Create a small and simple test stand to connect the control circuit for an electrical motor (the control circuit already exists) with the electrical motor itself (motor already exists) and to control the electrical motor based on a target vehicle speed. The vehicle speed shall be simulated based on the engine speed, the vehicle wheel diameter, gearbox transmission ratio (variable), time and total transmission ratio. The software that runs on the control circuit exists and has to be updated for this stand.
To reach the target vehicle speed should be used a PID control loop.

TECHNICAL KNOWLEDGE
- Electronic circuits (basic)
- Electric engines control (basic)
- Programming in C language (medium)

TESTS
- ANSI C

NR. OF STUDENTS
1

COACH
Sebastian Taurescu
Marcel Iliescu
Sorin Orbulescu

JAVA APPLICATION TO CREATE/UPDATE/MANIPULATE XML FILES TO ANALYZE NVMY AREA FROM ECU

PROJECT DESCRIPTION
NVMY area must be read and interpreted in an easy-to read format.
We would like to update a Java application which manipulates these XML files and generates Excel reports.

TECHNICAL KNOWLEDGE
- Java Eclipse
- XML

TESTS
- Java
- C++

NR. OF STUDENTS
1

COACH
Viaceslav Guzun

USING TESSY (CLASSIFICATION TREE EDITOR) DEFINE AND EXECUTE TEST CASES BASED ON EQUIVALENCE CLASS PARTITIONING AND BOUNDARY CHECK

PROJECT DESCRIPTION
We are introducing a new tool for module test called Tessy. A goal of this project will be to use module Classification Tree Editor (CTE) which is part of the Tessy to define and execute test cases for module test. As well as a documentation on how to use CTE.

TECHNICAL KNOWLEDGE
- C programming language. Knowledge of equivalence classes and boundary check is a plus

TESTS
- ANSI C

NR. OF STUDENTS
2

COACH
Viaceslav Guzun

INTERACTIVE MOBILE APPLICATION WITH AR AND VR TECHNOLOGIES

PROJECT DESCRIPTION
Mobile application (Android or OS) for the description of the activity and products engineered by Vitesco Technologies company.
The app will provide functionalities like: interactive quiz, virtual reality/ augmented reality scene for different products realized by the company, possibility to apply for open positions in the company.

TECHNICAL KNOWLEDGE
- Android or OS technology
- OOP knowledge

TESTS
- Java
- OOP techniques

NR. OF STUDENTS
2

GRAPHICAL INTERFACE FOR AUTOMATIZATION OF SW DEVELOPMENT

PROJECT DESCRIPTION
Create a Matlab GUI which allows the user to validate and correct model against a specific set of rules (model name, block color convention, unique handler for each DD variable), handling libraries, run in MIL and SIL several models or the whole project.

TECHNICAL KNOWLEDGE
- C#
- C++
- JAVA
- Matlab/ Simulink
- German speaker is a plus

TESTS
- ANSI C
- C++
- C#
- Java
- Matlab

NR. OF STUDENTS
1

COACH
Muntean Ioana
Feniser Oana

TEST SCRIPTS DEVELOPMENT FOR RAPID PROTOTYPING

PROJECT DESCRIPTION
Develop a test script in Python to test the functionality rapid prototyping. This involves accessing different tools via Python for modifying the program code on an ECU, and flashing the modified code to the ECU.
Develop a short embedded C code which is used for testing the ECU together with the Python script.
Automate the developed test via an existing Jenkins test automation.
The student will be introduced to the following topics:
- Measurement and calibration tools and protocols for automotive ECUs;
- Writing tests in Python, embedded C;
- Modifying existing SW code without compiling it.

TECHNICAL KNOWLEDGE
- Embedded C
- Python
- Jenkins (optional)

TESTS
- Microcontrollers
- C++
- Python

NR. OF STUDENTS
1

COACH
Simon Eder
Mihai Boruga
Balogh Attila

TEST CELL SOLUTION BASE ON ST MICROCONTROLLER FOR AUTOMATION TEST PLATFORM

PROJECT DESCRIPTION
This Platform is base on STM32G micro family and the scope of it is to be base cell for TSW Automation test architecture.
Features:
- CAN FD communication to support STP protocol to be easily plugged on the Test network;
- Complex analogic/digital signal generator function;
- Fine tuning voltage output base on DAC;
- Frequency signal measurement;
- CAN node testing;
- Configurable CAN Ids for Testing Node plugging;
- STP core integrated.

TECHNICAL KNOWLEDGE
- C language
- 32bit Microcontroller

TESTS
- ANSI C
- Microcontrollers
- C++
- C#
- Java
- Matlab
- Labview
- IT
- Hardware
- Mechanics

NR. OF STUDENTS
1-2

COACH
Dinu Boran
Raul Iovescu
Balogh Attila

SW APPLICATION FOR NUMERICAL SIMULATIONS PROCESS TOOLS

PROJECT DESCRIPTION
Platform creation for the tools (simulation reports, calibration reports, etc.) used in the numerical simulation process.

TECHNICAL KNOWLEDGE
- Data structures and algorithms
- Source control
- Text editors
- Data bases

TESTS
- C++
- C#
- Java

NR. OF STUDENTS
1

COACH
Monica Buzdugan

AUTOMATIZATION WITH MICROCONTROLLER DSPIC. CONTROL OF AIR FLOW IN ORDER TO NOT OVERLOAD THE FLOW SENSOR

PROJECT DESCRIPTION
The task is to create the SW for dsPIC in order to control the electric proportional valve (control the flow). The valve must protect the flow sensor against overload in time. We use MPLab X for dsPIC coding.
The HW needed can be created by the student, too (it is a plus).

TECHNICAL KNOWLEDGE
-Microcontrollers

TESTS
- Microcontrollers
- C++
- ANSI C
- Matlab
- Labview
- Hardware

NR. OF STUDENTS
1

COACH
Maxim Daniel
Muresan Daniel

AUTOMATIZATION WITH MICROCONTROLLER DSPIC. CONTROL OF ACTUATORS ACCORDING TO MOVEMENT PROFILE

PROJECT DESCRIPTION
The task is to create the SW for dsPIC in order to move the actuator according to a movement profile. The actuator has the sensor which gives the angular position of the main shaft and which is used to control the movement. We use MPLab X for dsPIC coding.
The HW needed can be created by the student, too (it is a plus).

TECHNICAL KNOWLEDGE
- Microcontrollers

TESTS
- Microcontrollers
- C++
- ANSI C
- Matlab
- Labview
- Hardware

NR. OF STUDENTS
1

COACH
Maxim Danie
Muresan Daniel

APPLICATION FOR AUTOMATIC CONTROL OF THE TEMPERATURE, IN A CLIMATE CHAMBER

PROJECT DESCRIPTION
The PC application is meant to automatically control a climate chamber used to test ECU's. Based on the fluctuation of the temperature, the behavior of the ECU's is under observation.
The communication between PC and Climate Chamber is realized on RS232 connection.
C# is used for the development of the application.

TECHNICAL KNOWLEDGE

- C#
- C

TESTS

- ANSI C
- Microcontrollers
- IT
- Hardware
- Mechanics

NR. OF STUDENTS

1

COACH
Marius Lazarescu
Feniser Oana

AUTOMATED TESTING FOR RTOS

PROJECT DESCRIPTION
The Automated Testing for RTOS will be developed and used in order to perform automatically regression tests for RTOS sw product.

TECHNICAL KNOWLEDGE

- Python
- Embedded C
- Basic HW

TESTS

- Microcontrollers
- C
- HW

NR. OF STUDENTS

1

COACH
Fodor Alexandru
Balogh Attila

DIGITAL SIGNAL RECORDER (DSR)

PROJECT DESCRIPTION
The Digital Signal Recorder (DSR) will be developed and used for recording a sequence of events on multiple signal lines considering digital signal levels. It will be composed from 2 parts: one embedded system and the other one as a GUI.
The proposed development environments are the following:
> For the embedded part the Microchip MPLAB on a PIC microcontroller will be used
> The GUI will be done using Microsoft Visual Studio environment in C#.

TECHNICAL KNOWLEDGE
- Embedded C
- C# know-how

TESTS
- ANSI C
- Microcontrollers
- C++
- C#

NR. OF STUDENTS
1

COACH
Mihai Ionas
Balogh Attila

AUTOMATED TESTING SWITCHBOX INTERFACE IMPLEMENTATION (ATSII)

PROJECT DESCRIPTION
The Automated Testing Switchbox Interface Implementation will be developed and used in order to be able to simulate and control a system environment in which an Engine Control Unit will receive specific signals.
The project will be composed from 3 parts:
> an embedded part which will control HW switchbox
> one HW switchbox (composed by relays & microcontroller)
> an interface provider developed in C#/Python which will be used by the Automated
Tests Scripts

TECHNICAL KNOWLEDGE
- Embedded C
- C# know-how
- Basic HW

TESTS
- Microcontrollers
- C++
- HW

NR. OF STUDENTS
1

COACH
Adrian Dragomir
Balogh Attila

ANTI-THEFT FACE RECOGNITION AND VEHICLE STARTER ON FACE DETECTION SYSTEM

PROJECT DESCRIPTION
This project can be split into two parts:
1.Vehicle Starter on Face Detection
The face recognition-based car starter system literally replaces the car ignition by replacing the key with specific user face. The face detection system takes multiple photos of the person and stores this data into its database. While scanning, when the face is detected by the camera the system compares the given face with the images in the database and authorizes the person, if the person is already registered then it starts the vehicle or else identifies the person as Invalid user and a buzzer goes off and access is denied and the motor doesn't start
2.Anti-Theft Face Recognition System
This is a system which can be utilized in many cars. Today, it is not difficult to make duplicates of vehicle keys and using such keys increases the risk of robbery. The system uses face recognition system to identify the authorized users of the vehicles and only the authorized users are allowed to use the vehicle. This allows for a fast easy to use authentication system. After successful registration, the owner can start the vehicle. If an unauthorized user tries to use the car, the system scans the person's face, and checks whether face matches with the authorized face, if it does not match the system denies and a buzzer starts

TECHNICAL KNOWLEDGE
- ANSI C
- Microcontrollers

TESTS
- RaspberryP
- IEmbedded C
- Linux
- Python

NR. OF STUDENTS
1-2

COACH
Florin Anton

PARALLEL COMPUTING IN HPC CLUSTER BASED ON HETEROGENOUS RPI NODES

PROJECT DESCRIPTION
The students are expected to create a HPC cluster based on RPI nodes following available guidelines.
Expectation at the end of the project, is to provide the gained theoretical background on parallel computing in high performance computing, a working Raspberry PI based parallel computing cluster and the documentation explaining the set-up.
The pits and falls of this "parallel computing" cluster will be highlighted using some simple applications developed during the project.
HW support: 1xRPI2, 1xRPI3B and 1xRPIB+ boards.

TECHNICAL KNOWLEDGE

TESTS
- ANSI C
- Microcontrollers
- C++
- C#
- Java
- Matlab
- Labview
- IT
- hardware and mechanics

NR. OF STUDENTS
1

COACH
Gabriel Gîrban

HARDWARE

ARBITRARY WAVEFORM GENERATOR

PROJECT DESCRIPTION
Develop HW and SW system capable to import arbitrary wave form parameters via PC and can be used to supply stand-alone the connected automotive sensors in order to test robustness of sensors against voltage drops. (Demo sample already exists, student must understand and upgrade the existing system in order to optimize it).

TECHNICAL KNOWLEDGE
- HW Digital/Analog;
- Labview;
- Excel;
- Measurement Equipment's (Oscilloscope, Voltage Amplifier).

TESTS
- Hardware;
- Microcontrollers;
- Labview;
- PCB design - Layout.

NR. OF STUDENTS
3

COACH
Radu Ciucur

OPTICAL MEASUREMENTS FOR LIDAR AND CAMERA SENSORS

PROJECT DESCRIPTION
Perform test measurements in optical lab for Lidar and Camera Products and understand the main performance parameters of both technologies.

TECHNICAL KNOWLEDGE
- Optics;
- Lenses;
- Sharpness;
- Laser RX / TX.

TESTS
- Hardware;
- Microcontrollers;
- Labview;
- PCB design.

NR. OF STUDENTS
2

COACH
Radu Ciucur

hardware

POWER SUPPLY MODULE USED FOR EMC INVESTIGATIONS

PROJECT DESCRIPTION

Power supply modules that use LDO's and can substitute the power supply used on the development projects during EMC tests.
Each power supply should have the capability to be connected to the car battery and can be controlled individually.

Schematic and Layout is needed.

Validation of the power supply is mandatory.

TECHNICAL KNOWLEDGE

- DC – DC convertor;
- LDO;
- Basics electronics.

TESTS
- Hardware

NR. OF STUDENTS
1

COACH
Ciprian Hant
Luput Catalin

AUTOMOTIVE RADAR SENSOR MODEL SIMULATION IN MATLAB

PROJECT DESCRIPTION

Develop a model for an automotive radar with phased array antenna, including:
- Model of the transmit / receive hardware;
- Signal processing;
- Target detection and estimation;

TECHNICAL KNOWLEDGE
- Signal Processing;
- Antenna and propagation.

TESTS
- Matlab;
- Microcontrollers.

NR. OF STUDENTS
1

COACH
Samfirescu Constantin

MOUNTING AND ROTATING UNIT FOR AUTOMOTIVE RADAR MEASUREMENTS

PROJECT DESCRIPTION
In order to perform several measurements and test trials with the Continental automotive radars a complete specific setup is needed.
The complete setup itself is composed of several hardware, mechanical and software components.
One of the most important hardware/mechanical components is the radar mounting and rotating setup unit (further called RU).
The RU must perform the following main tasks:
- at least 2 axis planar movements (X and Y axis – azimuth and elevation);
- automated remote control of the movements;
- feedback of the positioning on the 2 axis;
- possibility for fine adjustment of the radar bracket;
- HMI for the RU control;

TECHNICAL KNOWLEDGE
- Hardware and mechanics;
- Microcontrollers.

TESTS
- Matlab;
- Labview.

NR. OF STUDENTS
1

COACH
Madalin Volintiru
Constantin Samfirescu

AUTOMOTIVE ETHERNET GIGABIT CONVERTER

PROJECT DESCRIPTION
The result of the project will be an tool called Continental Engineering Services Integration Tooling – (Ethernet) Media Converter (CESIT-MC4), that can be used to convert data from 1000Base-T Ethernet standard to 1000Base-T1 Ethernet standard that is used in automotive environment. It can be used e.g. to interconnect automotive ECU's to standard IT equipment like Ethernet Switches or directly to PC's.

The CESIT-MC4 therefore can close the gap between the technology used within the vehicles and the standard IT world. This allows an easy tracing, debugging, downloading to the target, prototyping (Eval Boards with standard Ethernet connector) etc.

TECHNICAL KNOWLEDGE
- Students: 2-3 year of study;
- HW Knowledge Required: Signal and Systems, Basic Electronics, Ethernet Design , Basic OSI Model Overview;
- MD Knowledge Required: Catia/Creo knowledge, tolerance calculation, Technical drawing, Manufacturing technologies;
- SW Knowledge Required: Basic ANSI C, Basic microcontroller understanding, Basic OSI Model Overview.

TESTS
- For HW student CES requires hardware test and technical interview;
- For MD student CES requires mechanics test and technical interview;
- For SW student CES requires ANSI C, Microcontrollers test and technical interview.

NR. OF STUDENTS
5

COACH
Tiberiu Molnar
Sabin Bindiu

LOW NOISE SIGNAL AMPLIFIER

PROJECT DESCRIPTION

This project involves going trough the all the major steps to develop a functional piece of equipment: analyzing requirements, circuit development, circuit simulation, layout development, assembly and testing.

The project its self involves designing an amplifier to be used for measuring very low level signals(<1mV). The amplifier needs to have a high gain factor but also a very low noise figure. The design will involve a balance between these two main factors as well as integrating high order filters to clearly limit its bandwidth.

TECHNICAL KNOWLEDGE

- Electronics.

TESTS

- HW.

NR. OF STUDENTS

2

COACH

Szasz Francisc
Morariu Calin

TESTING IN ELECTROMAGNETIC COMPATIBILITY FOR LATEST ELECTRONIC PROJECTS DEVELOP IN AUTOMOTIVE AREA FOR TIER 1 OEM (DAIMLER, BMW, VW, ETC.)

PROJECT DESCRIPTION

Testing in EMC (electromagnetic compatibility) area for all projects developed in R&D Timisoara from all BU's. Latest technology that will be implemented in future cars, HV area and autonomus driving technology.

TECHNICAL KNOWLEDGE

- ETC RF topics.

TESTS

- HW.

NR. OF STUDENTS

1

COACH

Buta Adrian
Aipu Relu

hardware

SMART ACTUATOR ELECTRONIC CONTROL

PROJECT DESCRIPTION

The purpose of the project consists in studying and testing electrically different topologies of electronic control units that can have integrated or external actuators such as:
> Direct Current Motors (DC Motors)
> Brushless Direct Current Motors (BLDC Motors)
> Solenoids/ Valves

TECHNICAL KNOWLEDGE

- Power Electronics
- Microcontrollers
- Sensors.

TESTS

- LabVIEW
- Hardware

NR. OF STUDENTS

1

COACH

Adrian Orhei

hardware

MECHANICS

FIXING OF LARGE DISPLAY WITH ADHESIVE TAPES

PROJECT DESCRIPTION

The scope of this project is to develop a concept, to design and produce the necessary parts and equipment, for testing a large display fixed with the help of adhesive tapes. The student will have the opportunity to learn the clusters basics, to make CAD design, to get in contact and to see how the sample shop/machines are working.

As well the student need to get in contact with adhesive tape supplier and together to choose the best tape for the application.

At the end the student can take part at the acquirement testing, and result analysis.

TECHNICAL KNOWLEDGE

- The student should have finished II year of Technical University.

TESTS

- Mechanics

NR. OF STUDENTS

1

COACH

Adrian Trocan
Stefanut Daniel

AUTOMOTIVE ETHERNET GIGABIT CONVERTER

PROJECT DESCRIPTION

The result of the project will be an tool called Continental Engineering Services Integration Tooling – (Ethernet) Media Converter (CESIT-MC4), that can be used to convert data from 1000Base-T Ethernet standard to 1000Base-T1 Ethernet standard that is used in automotive environment. It can be used e.g. to interconnect automotive ECU's to standard IT equipment like Ethernet Switches or directly to PC's.

The CESIT-MC4 therefore can close the gap between the technology used within the vehicles and the standard IT world. This allows an easy tracing, debugging, downloading to the target, prototyping (Eval Boards with standard Ethernet connector) etc.

TECHNICAL KNOWLEDGE

- Students: 2-3 year of study;
- HW Knowledge Required: Signal and Systems, Basic Electronics, Ethernet Design , Basic OSI Model Overview;
- MD Knowledge Required: Catia/Creo knowledge, tolerance calculation, Technical drawing, Manufacturing technologies;
- SW Knowledge Required: Basic ANSI C, Basic microcontroller understanding, Basic OSI Model Overview.

TESTS

- For HW student CES requires hardware test and technical interview;
- For MD student CES requires mechanics test and technical interview;
- For SW student CES requires ANSI C, Microcontrollers test and technical interview.

NR. OF STUDENTS

5

COACH

Tiberiu Molnar
Sabin Bindiu

HYDRAULIC TEST BENCH EXTENSION & MEASUREMENTS

PROJECT DESCRIPTION

The student shall be given the task to design an extension to the hydraulic test bench which consists of a hydraulically controlled system which is provided with fluid power from one of our pumps.

The project shall consist of CAD modeling and 2D drafting of the above-mentioned extension. Also, the student shall be involved in measuring certain data in given experiments on the test bench.

TECHNICAL KNOWLEDGE

- CAD modeling
- 2D drafting
- Understanding of manufacturing technologies
- Understanding of GD&T principles
- Hydraulics
- Sensors

TESTS
- Mechanics

NR. OF STUDENTS
1

COACH
Andrei Farago
Minzat Cristian

DC MOTOR SIMULINK MODELING

PROJECT DESCRIPTION

Creating mathematical models of DC motors, to be able to simulate mechanical and electrical characteristics, temperatures, tolerances and also estimation of endurance performance.

TECHNICAL KNOWLEDGE
-

TESTS
- Matlab
- Mechanics

NR. OF STUDENTS
1

COACH
Mihai Drienovsky
Muresan Daniel

ACTIVE PURGE PUMP FIXATION OPTIMIZATION

PROJECT DESCRIPTION
Develop multiple technical solution for APP fixation and running Design of Experiment
searching improved behavior under vibration.

TECHNICAL KNOWLEDGE
- Mechanics knowledge
- 3D modeling
- Microsoft Office tools

TESTS
- Mechanics

NR. OF STUDENTS
1

COACH
Soptica Silviu
Muresan Daniel

CAM MECHANISM STUDY

PROJECT DESCRIPTION
Develop a mathematical model for a cam mechanism.
Design and dimensioning the components actuating solution for specific automotive application using cam mechanism.

TECHNICAL KNOWLEDGE
- Mechanics knowledge
- 3D modeling
- Microsoft Office tools

TESTS
- Mechanics

NR. OF STUDENTS
1

COACH
Opre Calin
Muresan Danielu

SCREW PUMP STUDY

PROJECT DESCRIPTION
Understanding and documentating the working principle of a screw pump.
Develop multiple technical solutions for a screw pump, presenting advantages and disadvantages of chosen solution.

TECHNICAL KNOWLEDGE
- Mechanics knowledge
- 3D modeling
- Microsoft Office tools

TESTS
- Mechanics

NR. OF STUDENTS
1

COACH
Opre Calin
Muresan Daniel

CONTROL THE WATER INJECTION PUMP BASED ON SIMULATED WATER PRESSURE USING A TEST STAND

PROJECT DESCRIPTION
Create a small and simple test stand to connect the control circuit for a water injectionpump (the control circuit already exists) with the electrical motor of the pump (motor already exists) and to control the electrical motor based on a target water pressure.
The water pressure shall be simulated based on the engine speed and the time.
The software that runs on the control circuit exists and has to be updated for this stand.
To reach the target vehicle speed should be used a PID control loop.

TECHNICAL KNOWLEDGE
- Electronic circuits (basic)
- Electric engines control (basic)
- Programming in C language (medium)

TESTS
- ANSI C

NR. OF STUDENTS
1

COACH
Marcel Iliescu
Sebastian Taurescu
Sorin Orbulescu

TESTING

SW/ ALGORITHM DYNAMIC MODULE TEST

PROJECT DESCRIPTION

Dynamic Testing is defined as a software testing type, which checks the dynamic behavior of the code which is analyzed. The main aim of the Dynamic tests is to ensure that software works properly during and after the installation of the software ensuring a stable application without any major flaws.

The main purpose of the dynamic test is to ensure consistency to the software. Dynamic testing involves testing the software for the input values and output values are analyzed.

Dynamic Module/ Unit Test is an important step regarding ADAS development process. Dynamic Module/ Unit Test requires the execution of the software units. The software shall be executed in test environment: Cantata/ Courage (). Dynamic tests are performed with the knowledge of the module internals (written in C/ C++). This means that the branches and paths in functions and modules must be considered (code coverage).

TECHNICAL KNOWLEDGE

- C;
- C++.

TESTS

- ANSI C;
- C++.

NR. OF STUDENTS

15

COACH

Mihaela Vitalariu
Andrei Rusan
Amza Cristian

AUTOMATIC TESTING OF AN AIRBAG CONTROL UNIT

PROJECT DESCRIPTION

As a student in Passive Safety Test Group you will learn about Airbag Control Unit, get in contact with the latest test equipment on the market, use SW functions to control complex/Real Time measuring equipment.

Inside our team we have several exciting projects open for you:
- develop HW & SW tools that enable automatic test activities for the Airbag Control Unit.
- develop automatic tests using C# and the preexisting CFramework.
- maintain & develop Excel macros for test result evaluation

TECHNICAL KNOWLEDGE

- Good programming skills;
- Basic electronics & uController know-how.

TESTS

- ANSI C;
- C#;
- hardware.

NR. OF STUDENTS

2

COACH

Murgulescu Antonie

MODEL BASED DEVELOPMENT - MATLAB

PROJECT DESCRIPTION
Matlab model integration in Autosar project:
- Integrate the model;
- Perform tests;
- Perform analysis on the failed tests.

TECHNICAL KNOWLEDGE
- ANSI C - advanced;
- Matlab – basic.

TESTS
- ANSI C;
- Embedded SW/ Microcontrollers.

NR. OF STUDENTS
1

COACH
Dorin Ogner

AUTOMATIC ECU FLASHING AND JENKINS CONFIGURATION

PROJECT DESCRIPTION
When a new SW version is available in the Change Management tool, flash it on the ECU (using HW device) and start running basic tests on that ECU. After, create a Test Report with the validation results.

To do:
- Create scripts (bat files) needed for automatic execution;
- Jenkins configuration setup;
- Adapt HW flashing solution to allow automatic flashing;
- Test the full tool chain.

TECHNICAL KNOWLEDGE
- programming;
- basic hardware.

TESTS
- Microcontrollers;
- C++;
- C#;
- Python;
- Hardware
- Windows scripting.

NR. OF STUDENTS
1

COACH
Razvan Miclea
Cristea Cristian

AUTOMATIC TEST SEQUENCE GENERATOR

PROJECT DESCRIPTION
Based on a predefine test strategy, choose the proper Test Cases from a Configuration Management tool and export them as test sequences in a system test tool. Afterwards, run these test case automatically and create Test Report for test results in Configuration Management.

To do:
- Get data (Test cases) from a data base – select only the ones proper to the defined testing strategy;
- Convert them in a scripting language (C/C++/python);
- Run these scripts on a real ECU;
- Test the entire full chain.

TECHNICAL KNOWLEDGE
- Programming;
- HW is a plus.

TESTS
- Microcontrollers;
- C++;
- C#;
- Python;
- Hardware.

NR. OF STUDENTS
1

COACH
Elvin Bliojiu
Cristea Cristian

AUTOMAT CHECKING OF EXISTING TEST STEPS IN TEST AUTOMATION LIBRARY

PROJECT DESCRIPTION
Check in the automation tool if the test step that the user wants to use is already existing or not.
In this case, no double work is needed, test number will be reduced and test step quality will be increased because will be reviewed from many users.
What we need to do:
1. When a new user wants a test step click search;
2. Enter some Key words (or the Test Step from DD);
3. Search through the entire Test Automation Library;
4. Recommend the test step if exists.

TECHNICAL KNOWLEDGE
- Programming;
- Python knowledge is a plus.

TESTS
- C++;
- C#;
- Java.

NR. OF STUDENTS
1

COACH
Ionut Popescu
Cristea Cristian

AUTOMATION OF SYSTEM TEST CASES

PROJECT DESCRIPTION
Automate (create scripts for) System Test Cases, using Continental Automotive tools and programming solutions.
Run and debug the created scripts to ensure a proper and stable operation.

You will have the chance to learn about Continental Smart Access products, testing process and   equipment.

Note: System test cases (scenarios necessary for testing our product) are already available in text format, in a database.

TECHNICAL KNOWLEDGE
- Medium programming skills;
- Basic electronics knowledge.

TESTS
- ANSI C;
- Microcontrollers;
- Hardware.

NR. OF STUDENTS
2

COACH
Emilian Pop

AUTOMATED TESTING OF INTER-CONTROLLER COMMUNICATION IN AN EHORIZON BODY CONTROL UNIT PROJECT

PROJECT DESCRIPTION
Develop a set of automated test cases that cover the features impacted by the communication between the real-time RTOS controller and the Linux controller of an eHorizon body control unit.
Main tasks:
- Understand the architecture of the dual controller ECU and the features implemented on the real-time controller;
- Get to know the Linux simulator application that will communicate over SPI with the real-time controller;
- Adapt the test environment (C#) to communicate with the Linux simulator application in order to send commands for the real-time controller;
- Develop new test cases in the test environment and update the Simulink test application (model based development);
- Oversee the CAN communication between the ECU and the test environment;

TECHNICAL KNOWLEDGE
- ANSI C;
- Embedded systems / Microcontrollers.

TESTS
- ANSI C;
- Microcontrollers;
- C#.

NR. OF STUDENTS
2

COACH
Cristian Paunescu

TEST AUTOMATION FOR CLUSTER INSTRUMENT

PROJECT DESCRIPTION

Our Scrum teams develop Software for instrument clusters and one the activities performed by the team is the testing area. This is specific for each team – and also for each area of the project.

Your task will be to create and automate test cases to cover one or more functionalities of the cluster. We expect you to identify possible errors in the implementation and to discuss the result with the developers and suggest implementation alternatives.

You will learn how our products are working, how they are developed, you will know one or more functionalities of the instrument cluster from the requirements point of view and from the implementation point of view.

We are using mostly two tools for this: Robot Framework and gTest.

TESTS
- ANSI C;
- Microcontrollers;
- C++;
- C#.

NR. OF STUDENTS
1

COACH
Cristian Jianu

ACCESS AND START PRE-DEPLOYMENT GENERIC TEST BENCH

PROJECT DESCRIPTION

In the pre-deployment team, several generic access and start SW components are put together from different generic SW teams, are tested together within a generic test environment and delivered to target projects in remote locations.

Summer practice student will work together with SW engineers in enhancing the generic test environment. It will have an assistant/supporting role where he/she will receive implementation and/or researching tasks that will support enhancing the generic test environment.

TECHNICAL KNOWLEDGE
- Should be familiar with SPI, I2C serial communication interfaces;
- Knowledge of CAN communication interface would be considered an advantage.

TESTS
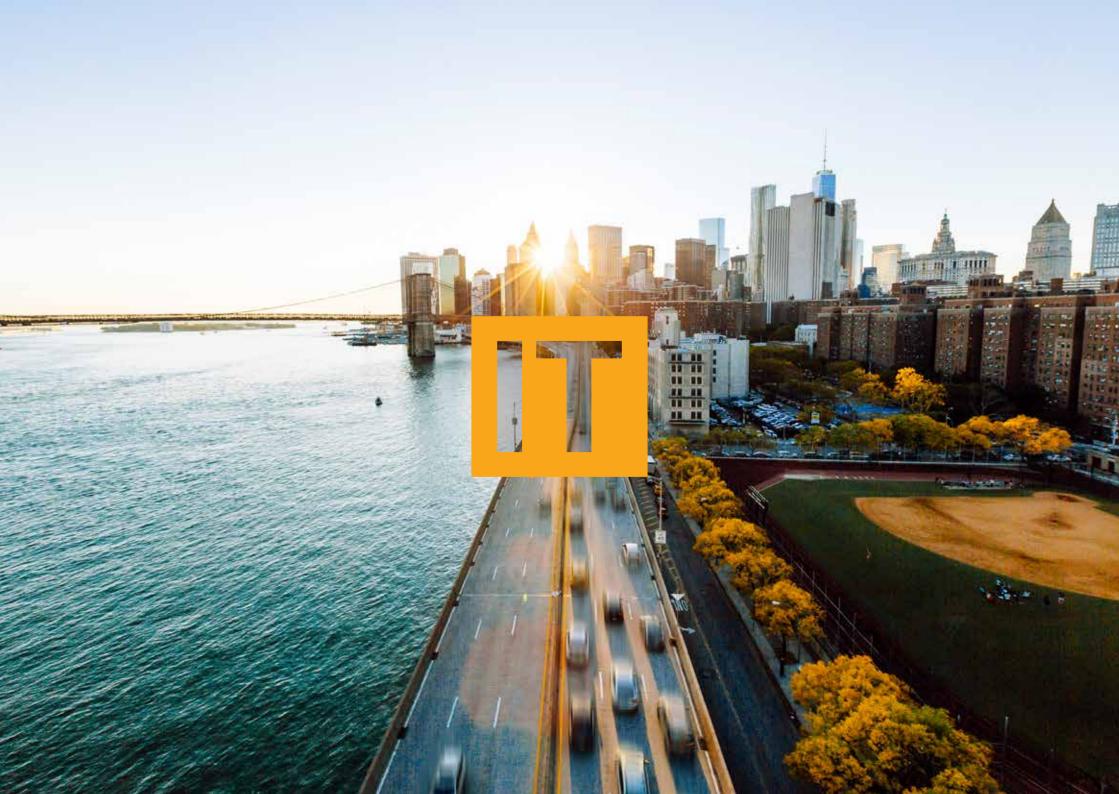- ANSI C;
- Microcontrollers;
- Hardware.

NR. OF STUDENTS
1

COACH
Trif Simona
Pop Stefan Daniel

testing

SHAREPOINT / OFFICE 365 ACTIVITIES

PROJECT DESCRIPTION
As a part of SharePoint and Office 365 operations, the internships would consist of:
- tasks in the area of Continental's global SharePoint and Office 365 infrastructure;
- documentation and participation in activities related to SharePoint and Office 365;
- management and administration of the above-mentioned infrastructure.

TECHNICAL KNOWLEDGE
- T administration skills (server, networking) a plus;
- Experience with Office / SharePoint a plus.

TESTS
IT

NR. OF STUDENTS
2

COACH
Alin Bria

VIRTUALIZATION SERVICE FOR EXTERNAL COMPANIES

PROJECT DESCRIPTION
Using the latest software and solutions from VmWare we are offering a software as a service solution for external companies contracted by Continental
You will be learning and working with:
- Windows 7 and 10 clients
- Microsoft office (word, excel, outlook)
- Windows servers
- Active directory
- Networking services
- VmWare vSphere
- Firewalls

TECHNICAL KNOWLEDGE
- Basic IT knowledge about technologies, software and hardware;
- Passionate about IT.

TESTS
IT

NR. OF STUDENTS
1

COACH
Tudor Radu
Pandia Roxana

FEBRUARY 2020

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The Future in Motion