

PRIMATEC GRADUATION PROJECTS

2019-2020

ABOUT US

Primatec Engineering, as a prominent offshore outsourcing company specialized in the test and development of electronic controllers, delivers solutions that help clients achieve their goals quickly and without any hassle. Unlike other companies, we don't just promise excellence, but take effective measures to ensure best results. Reliability, efficiency, and expertise are our core principles.

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"We don't just promise, we succeed!"

Primatec at a Glance



Hired Trainees

From O8 trainees, we hired

2017

2018 From 17 trainees, we hired 08.



Our team continues to expand, our expertise continues to grow, but our goal of providing clients with the most thorough software testing and QA services remains unchanged.

Trusted by



Make the most of your internship period with Primatec Engineering! Find your dream job! Build your Future career with us!

There are still places available for all students and graduates from universities. You can gain professional experience in your chosen project while discovering our culture and learning skills.

How to apply?

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Send	$ \rightarrow $	То	XX	internship@primatec.tn	\square
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		Subject	\mathbf{X}	Ref: "2020 GP – Ref Project"	\bigtriangleup

Send an up to date CV to internship@primatec.tn mentioning the project you wish to work on.

If you are interested in more than 1 project, you can cite all those for which you apply in order of decreasing preference in the body of the email.

- More than 200 employees work for Primatec.
- More than 50 employees join Primatec every year.
- More than 80% of our employees are young graduates.



Project 01: Test Environment Setup Graphical Tool

Ref: 2020 GP-01

Description of the Project:

The purpose of the project is to implement a graphic design tool to configure and validate the Test Environment setups. The lab responsible will configure the connectors/links to the different pins of the different HW components.

Keywords:

- Friendly user interface, Export import configuration
- Module Automotive Testing System
- 1. Graphic design Module (HW components/Links toolbox).
- 2. Parsers/generators (excel, json, xml).
- 3. Schema validator module.



From 4 to 6 months



Automotive Testing System

Technologies: C#.net, Windows Form, WPF

Required Educational background Computer Science or relevar degree

> Highly required Oriented Object Logic C#.net



Project 02: Test Process Assessment Dashboard

Ref: 2020 GP-02

Description of the Project:

A data dashboard is an information management tool that visually tracks, analyzes and displays the key performance indicators (KPI). The purpose of the project is to collect all the data related to the test process and generate KPI's for test process assessment. The idea is to use the collected data to measure the efficiency of the test activities (the Bugs found, the Incidents recorded...etc) and the team workload in order to detect the project risks.





Required Educational background Computer Science or relevant degree



Project 03: Intelligent Risk Assessment Dashboard

Description of the Project:

Software testing metrics are a way to measure and monitor the test activities. More importantly, they give insights into your team's test progress, productivity, and the quality of the system under test. When we ask ourselves "What have we tested?", metrics will give us better answers than just "we have tested it." Different teams measure various aspects depending on what they want to track and control or improve.

The aim of collecting test metrics is to use the data for improving the test process, rather than to just show fancy reports.



Ref: 2020 GP-03



Technologies: Kibana, Elastic Search, Java, Eclipse, git, Jenkins, Python, Pandas, Mongodb, numpy

Required Educational background Computer Science or relevant degree

Language:

English

Project 04: 3D Test simulator

Ref: 2020 GP-04

Description of the Project:

The purpose of this project is to design and implement an academic test environment with a 3D model to simulate the manual test of a vehicle. The idea is to simulate all the actuators of a car in a 3D model and map the triggers between this model and the Embedded system to be tested.



Technologies:

Required Educational

background

Language:

English



Modules

1.Vehicle 3D module

2.Mapping Module between Embedded Automotive System and 3D module 3.Test Actions/Trace logger

0 1Trainee



From 4 to 6 months

Project 05: Automotive Gateway table Editor

Description of the Project:

The purpose of this project is to design and implement an editor to load and save Gateway table files and validate their syntax. The insertion of new messages must be supported considering the existing ones in order to avoid conflicts. Also, the tool must be able to simulate the generation messages and visualize their corresponding input and output signals.

1 trainee Fro

From 4 to 6 months

Project 06: Intelligent Pre analysis Tool

Description of the Project:

The automatic validation process generates trace files which contain all the traffic exchanging during the test executions. In order to optimize the analyses process, we need to implement an intelligent tool to make an automatic pre analysis based on the defined configuration. The tool will parse all the trace files (*.pcap, *.asci) and try to detect the common errors.

Contrainee



Ref: 2020 GP-05



Technologies:

.net , C#, xml, git

Required Educational background Computer Science or relevant degree

Ref: 2020 GP-06

Technologies: POO, C#.Net, Winpcap, CAN, LIN, Flexray, Ethernet Required Educational background Computer Science or relevant

degree



Language: English

Project 07 : BPM Tool Management Systems

Description of the Project:

The project consists of creating a tool for the configuration and the implementation of the process workflows. An investigation of the currently available BPM tools such as Bonita is a part of this project.



From 4 to 6 months

Project 08 : Graphic Test Design Tool

Description of the Project:

The test design is an important step in the test process where testers define the scenario of the test to be executed for that we need to design and implement a graphic editor tool to represent those scenarios in a graphic model and generate the testcase code.







Ref: 2020 GP-07

Technologies: BPM, Workflows, automation, UML

Required Educational background Computer Science or relevan degree



POO, C#.Net, Winpcap, CAN, LIN Flexray, Ethernet **Required Educational background** Computer Science or relevant degree **Highly Required** POO, design skills



Project 09: Password Manager

Description of the Project:

To manage many accounts that require authentication, we must create and memorize several passwords. All passwords must be valid only for a limited period. Designing and implementing a password generator and manager is the purpose of this project.

This application must ensure the following conditions:

1-The user must authenticate himself/ herself before using this app.

2-Allow the user to add/delete an account.

3-Allow to generate a new password for the requested account according to its policies.

4-New generated passwords must be different from all previously used. 5-Passwords must provide a high entropy (difficult to quess by a second tier)

6-Allow to export passwords for the requested account to a csv file 7-The app must provide a clear and user-friendly GUI.

1Trainee





Ref: 2020 GP-09

Technologies:

Required Educational

background

Highly required

Language: English

Project 10: Validation Rules Generator

Description of the Project:

In order to perform the quality of the implemented testcases we need to automate the semantic validation steps and assist the testers during the implementation phase. The idea is to use the machine learning technique in order to predict the validation rules.

Technologies:

Highly required

1 Trainee

From 4 to 6 months





Ref: 2020 GP-10



Project 11: KPIs Measurement and follow up of Quality and Security Management Systems

Description of the Project:

For our ISO27001 certification we need to develop a platform that serves in:

• Collecting data from different Tools we are using e.g. Redmine, ITOP and Excel.

• Using these data to calculate KPIs defined for our management systems.

• Generating dashboards for KPIs follow up

Ref: 2020 GP-11



Technologies:

Required Educational background



Project 12: Go no Go Test automation

Ref: 2020 GP-12



Technologies:

Required Educational

background

Highly required

Objectives

Create an interface to execute Go no go tests on real manual test environment (TSP).

The tool will ping the user to make all the triggers based on real ECUs (Electronic Control Unit) following instructions in each Testcase.

All the asserts should be checked by the tool and the results [Outputs: log and traces] should also be generated automatically after the Testcase execution.

Some ECUs [not existing in TSP] should be simulated as the real ones as well.

Modules

1. Test automatization GUI 2. TCF testcase parser 3. Integration with TDF framework





Language: English



From 4 to 6 months





Project 13: Graphic test component panel

Description of the Project:

Testing the ECU (Electronic Control Unit) during the early development steps requires simulation of the Test Environment and easy manipulation of the input/output of the system to be able to reproduce a complete scenario without using a real component. To Make high level test, a graphical test component panel will enable a non-programmer tester to make the testing scenario in an easy way and detect errors in the SW.

The candidate needs to create a user-friendly GUI (Graphical User Interface) that can be used to:

-Create and define the test panel based on a pre-defined toolbox (widgets, buttons, lamp, actuators...)

-Configure the Test panel components to assign signal (to send and to view) and value waveforms

-Generate logs and traces during the execution of the test

1 Trainee





Ref: 2020 GP-13



Technologies: Required Educational background

Language: English

Project 14: Tasks Management Plugin for Eclipse

Description of the Project:

The purpose of the project is to provide to our testers an integrated test environment where they can get all the information related to their test activities. For that, we need to implement an eclipse plugin to manage all the tasks assigned to the tester and monitor the daily progress. The plugin will extract the task plan's information from diverse resources (Excel, Redmine, Atlassian Jira) and offer to the testers a friendly user interface to make an overview and report the assigned tasks.

Modules:

- Parsers for extracting the data from Excel, Redmine, Atlassian Jira, IBM Doors
- Dashboard for visualization

1 Trainee

- Tasks management tool





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Technologies:

Required Educational

background

Highly required



Project 15: Data warehouse system

Description of the Project:

We need to design and implement a data warehouse system to collect all the test activities data from diverse sources (Redmine, Atlassian Jira, Excel files, IBM Doors, Local Databases). The first step is to analyze all the different data sources and implement the necessary scripts for extracting and cleaning them. Once collected, we need to organize the data in an appropriate structure to make the analyses of the test activities and help the test managers to take the decisions. Modules:

- ETL modules for extracting and cleaning data
- Implement data structure
- Implement reporting/Analysis dashboard

1 Trainee

Ref: 2020 GP-15

Ö Ö Technologies:

Required Educational background

Highly required Database technologies, SQL

Language: English

Project 16 : Graphic Test Suite Design

Description of the Project:

Software testing is an essential and important technique for assessing the quality of a software/product. In order to simplify the strategic design and technique of the test case and to improve the quality of the software testing process, a Graphical test suite design helps the tester to design the relation between the different test cases, execute the test suite and generate reports based on the output result. To do this, the trainer needs to:

-Simulate the different system transition:State transition – Black Box techniques

- Define the different relations between the testcases

- Define a generic strategy to set the input/output of suite test cases

Ref: 2020 GP-16

Technologies:

Required Educational

background

Project 17 : Franca + Generator

Description of the Project:

In the context of Adaptive AUTOSAR and autonomous driving, the creation of the meta models of application is a heavy task consisting of writing XML file. Some scripting tools like Franca+ are used to generate those meta-models.

To make the task easier and more suitable, having a Franca+ generator will speed-up the autonomous driving application configuration.

The purpose of this project is to create a tool that parses the existing models and offers a graphical way in order to define the meta-class configuration of our autonomous driving application based on Adaptive AUTOSAR Architecture, to ultimetaley generate the Franca+ scripts.

Ref: 2020 GP-17

Required Educational background

1 Trainee

Language: English

Project 18 :

cameras.

Description of the Project:

Language: English

on Image Processing Nowadays, the autounomous driving systems are using a lot of input

Technologies:

The purpose of this project is to use several cameras and proceed to some image processing algorithm to detect the objects presented around the vehicle to help get the right decision(break, steering wheel to the left/right).

The mission is to develop an application above an adaptive Autosar Platform, to do the image processing from several inputs cameras and help taking the right decision depending on the inputs of the system.

Autonomous Driving System based

entries to determine the right decision to take for the autonomously

driving vehicle. One of the major inputs is images the vehicle gets from

Ref: 2020 GP-18

Required Educational background

Project 19: Intelligent Trace Comparator

Description of the Project:

For each failed scenario executed in our test benches, based on different trace format (.xml, .asc , .pcap, .txt), the testers try to detect the bugs introduced by the software of the tested ECU (Electronic Control Unit). Sometimes the problem could be caused by the test framework, the drivers of hardware or by configuration used in the test bench. So, it is highly needed to detect easily and quickly those problems.

Currently, we spend a lot of time trying to find the root cause.

The purpose of this project is to decrease the time needed for this analysis and improve the quality of our Infrastructure by detecting the mismatching between .asc and .pcap files based on the timestamp, payload, order of sent ...

Keywords:

Friendly user interface, comparator, converter

Modules:

1. Parser of Json and XML files.

2. Converter from .pcap to .asc

3. Comparator between two .asc files.

Ref: 2020 GP-19

Technologies:

C#.net, Windows Form, WPF **Required Educational background** Computer Science or relevant degree

> Highly required Oriented Object Logic C#.net

Project 20 : Trace Analysis Environment Generator

Description of the Project:

This project consists of implementing a tool to generate an environment configuration file of each trace file based on specific test cases.

The trainer needs to:

-Find a solution to extract the specific information from a test case (like bus, interfaces, filter, condition).

-Save all this information in a specific project or format like (an ATP file, configuration file)

-Load the generated file with the right trace file.

Ref: 2020 GP-20

Technologies:

.Net, Pytho

Required Educational background Computer Science or relevan degree

Language: English

Description of the Project:

We need to represent the system requirements through a test machine diagram. The purpose of this project is to implement a diagram editor to design the state machine and analyze the generated traces files based on the described behavior

Currently, we create Robot tests for testing user interface in desktop

applications manually which is time consuming, and prone to error for

small user interface changes. To speed things up, the project implementer

will provide a desktop application that records the testers actions and

saves them as a robot script. The final application will need to support

detection of buttons using their icons + OCR, and not based on screen

1 Trainee

Description of the Project:

coordinates.

Project 22: Auto Generation of Robot Framework Test Cases

From 4 to 6 months

Ref: 2020 GP-22

Technologies: obot Framework, Autolt, Sikuli Python, OCR, .NET, Image **Required Educational** background

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Language: English

Ref: 2020 GP-21 **Ö** Ø **Technologies:**

Highly required