

The logo for Sofiatech, with 'Sofia' in white and 'tech' in orange. The background of the entire page is a blurred office scene with several people. A woman in a red shirt is in the foreground, smiling and holding a notebook. Other people are visible in the background, some looking at devices. The overall tone is professional and modern.

Sofiatech

We Make **IT** Simple!

PFE BOOK 2023

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We deliver turn-key platforms for end-to-end services

Sofiatech, is an engineering, IT services and solutions company specialized in the design and integration of electronics, mechatronics, embedded software, cloud, digital transformation and the Internet of Things.

A skilled engineering staff and a responsive organization allow us delivering fast prototyping solutions, full scale cost efficient platforms as well as bringing superior designs of business applications for selected markets in Automotive, IT & Telecom, Medical, Agriculture, Smart Cities and largely in IoT.



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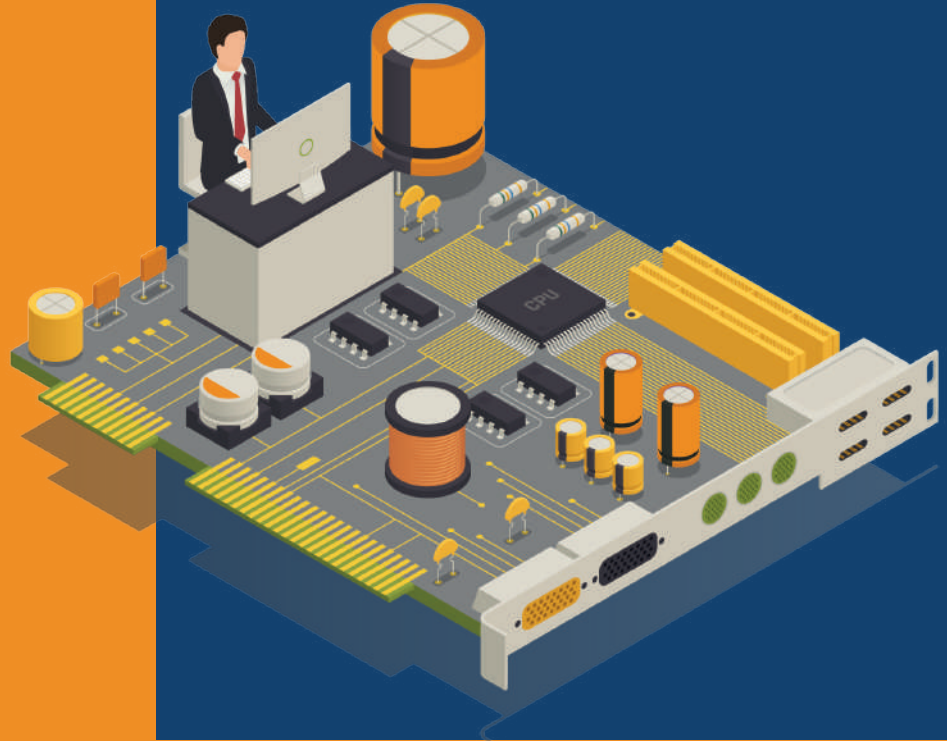
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EMBEDDED SYSTEMS



Bike Tracker

The system is based on a STM32L4 microcontroller, interfacing with GPS and BLE modules. It may be mounted in a bike and used to continuously capture and store ride-related data such as GPS location and speed.

The system support data synchronization using a BLE link.

Main features:

- The system should automatically detect the bike state (moving or not). When the bike is not moving, the system switches to low power mode to save energy.
- Periodically, ride information (GPS coordinates, bike speed and other related data) is acquired and/or calculated, and then stored into an external Quad SPI flash memory with associated timestamp.
- Ride information are displayed on an LCD screen (scrolling menus).
- The system may be paired with a BLE host (smartphone, computer or tablet).
A BLE host must be able to to synchronize system's data (ride information) and settings (user information, system configuration, ...).

Keywords:

STM32, embedded C, driver development, QSPI, BLE communication, GPS, Accelerometer/Gyroscope, RTOS, low power management.



4 MONTHS



2 POSITIONS

VPN on-chip Client

The system is based on a STM32H7 microcontroller, interfacing with ETH and USB interfaces.

It is a low-cost VPN client device providing VPN access to corporate cloud under many constraints.

Main features:

- TCP/IP embedded stack with IPSec support.
- Private key management.
- Ethernet communication over USB.
- L3 VPN packets forwarding.

Keywords:

STM32, embedded C, driver development, RTOS, TCP/IP, networking, internet security.



6 MONTHS



2 POSITIONS

gRPC-based Embedded Linux Manager

Design and develop of a gRPC based manager for MENZU PREMIUM internal Linux kernel

Main features:

- Networking (Ethernet, WIFI, Modem)
- Kernel (DTB, Modules)
- System (CPU, RAM, Direct methods, ..)
- Test (System test for specific project templates)

The manager should be integrated in a Yocto based distribution.

Keywords:

Linux, Embedded Linux, gRPC, Networking, Yocto, C++/Python



6 MONTHS



2 POSITIONS

Boot Integration, Optimization and Benchmarking for MENZU PREMIUM

Integrate various bootloaders for MENZU PREMIUM (U-boot, GRUB, BareBox) and benchmark different boot options (TFTP/NFS, PXE), and integrate different solutions for optimizing boot time including Bootloader, Kernel, and Rootfs. All development must be integrated into official MENZU PREMIUM Yocto BSP layer.

Main features:

- Bootloader developement
- Kernel Development
- Yocto

Keywords:

Yocto, Linux, C, Networking, Bootloader



6 MONTHS



2 POSITIONS

Media and Secure Boot Development and Integration

Develop and Design of U-boot feature/command that can work on graphical/non-graphical process that provides options to download a Yocto distribution to flash the memory (eMMC, ..) or load it to RAM and complete the Boot. Development is based on official MENZU PREMIUM U-boot sources.

Main features:

- Bootloader developement
- Yocto Patching

Keywords:

Yocto, U-boot, C, Networking



6 MONTHS



2 POSITIONS

Dual Cortex-A53/M4 Project Development and Integration for MENZU PREMIUM

Design and develop a project based on two OSs (FreeRTOS for Cortex-M4) and (Linux for Cortex-A53) that can communicate through RPMsg (Remote Process Messaging) or MU (Messaging Unit). Linux part is a kernel space module with a userspace application to analyze RTOS data.

Main features:

- Yocto integration
- Kernel Development
- Real time development

Keywords:

Yocto, C, Kernel, RTOS



6 MONTHS



2 POSITIONS

Embedded Linux Flask Configuration Manager Auto Generator

Design and Development of a module to generate a configuration manager for Embedded Linux system based on client's input according to board's hardware and software designs, the generated manager is a Flask-based application, and integrate in Yocto.

Main features:

- Yocto integration
- Python development
- Model design

Keywords:

Yocto, C++, Python, Flask, Linux



6 MONTHS



2 POSITIONS

OpenSync project development and integration for MENZU PREMIUM

Design and Development an OpenSync project for MENZU PREMIUM to create a home solution, the project requires the integration of OpenSync in Yocto and investigation for MENZU PREMIUM official Kernel drivers for Hardware support.

Main features:

- Yocto integration
- Software development
- Kernel development

Keywords:

Yocto, OpenSync, C, C++, Linux



6 MONTHS



2 POSITIONS

Automotive refactoring, design and development of a car controller board based on MENZU PREMIUM

Design and development of an advanced and robust automotive architecture for MENZU PREMIUM to behave as a main car controller with multiple signals mechanisms integration and ECU communication via SOMEIP. The architecture must be auto-testable and integrated as a separate Yocto layer.

Main features:

- Automotive development
- Kernel development
- Linux
- Diagnostics design

Keywords:

Automotive, C, Linux, Yocto, Diagnostics, SOMEIP, DLT, DBUS



6 MONTHS



2 POSITIONS

Embedded Linux Test interface generator for MENZU PREMIUM

Design and Development of DearIMGUI based project to set and run custom tests for MENZU PREMIUM regardless of the hardware and software project integration. Dependencies must be integrated into MENZU PREMIUM official Yocto BSP layer as a feature.

Main features:

- Software development
- Model design
- Yocto integration

Keywords:

Yocto, C++, Linux, Test



6 MONTHS



2 POSITIONS

Quality Assurance



Test automation of Sofiatech Smart Home mobile application

Based on the functional specifications of the mobile application, the tester must retrieve the acceptance criteria and then translate them into automated acceptance tests using the behavior-driven development method (BDD). Acceptance tests will be in Gherkin format. The choice of scenarios to be automated must take into account certain criteria such as: The frequency of tests, the coverage of tests, the complexity of the scenarios to be deployed and their maintenance, data sets, implementation costs and execution times...

Main features:

- Unit tests
- Smoke tests
- Integration tests
- System tests
- Non-functional tests

Keywords:

ISTQB knowledge, Appium, System requirements analysis, Gherkin, BDD
Programming language : Java



6 MONTHS



2 POSITIONS

Mobile



Design and perform a plugin to convert PSD files (GUI design) for mobile application development

Create a plugin in C/C++/Python to build and generate XML/Android/IOS layout file, this plugin will be used to help mobile developer (Native \ Hybrid \ Cross native) in design integration.

Main Features:

- Input : PSD file
- Output : XML file
- Compatibility with Android (Native) and flutter (Andoird / IOS)
- Responsive layout XML

Keywords:

C, C++, Python, PSD, XML, Mobile Development, Flutter, Android



6 MONTHS



2 POSITIONS

Mobile

Development of a Videophone Application

Creation of a mobile application to remotely manage Videophone systems, alarms by playing RTSP streams in Flutter mobile application

Main Features:

- Ability to launch RTSP stream from IP Camera by mobile application (Android / iOS)
- Ability to capture screenshots and recordings from the live video player
- If the installation is equipped with PTZ cameras, the user can control the camera lens in the horizontal and vertical direction and adjust the focal length
- Control in real time the images recorded

Keywords:

Flutter, android, rtsp, Flutter SDK, VIDEO player ...



6 MONTHS



2 POSITIONS

WEB



Design and develop a specific SRM application (Supplier Relationship Management)

SRM: Supplier relationship management offers an integrated approach to managing the interactions between a company and its suppliers of goods and services. Its objective is to streamline and optimize the relationship between the various stakeholders

Main features:

- Manage User, authentication and roles
- Manage communities
- DMS (Document Management System)
- Incident management
- Reimbursement management
- Certification management

Keywords:

Node.JS, Angular, Typescript, JSON, REST API, Gitlab, SVN, Nginx, NPM, Docker, HTML5/CSS3, Linux system and BASH scripts, MySQL



4 MONTHS



2 POSTS

Design and develop a WEB application to manage INT-Elegance tasks

INT-Elegance: This platform helps teams plan, assign, track, report and manage work.

Main features:

- Manage User, authentication and roles
- Manage hierarchy
- Manage tasks
- Display specific dashboard : Pert, Gantt, critical path
- Manage messages

Keywords:

Node.JS/ nest js , angular, Typescript, JSON, REST API, Docker, Gitlab, SVN, Nginx, NPM, HTML5/CSS3, Linux system and BASH scripts, MySQL/mongodb



6 MONTHS



2 POSITIONS

Cloud



Implementation of Continuous Deployment (CD) model for web applications using AWS services.

The main objective of this project is to propose an AWS architecture of continuous deployment for web applications with AWS considering the operational context of Sofiatech.

Main features:

- Construction of an infrastructure with AWS that allows the optimization of implemented CD model.
- Automation of AWS Services with Terraform.
- Ensure high availability of deployed services.
- Automate the security processes.
- Monitoring and control of DevOps pipelines using AWS and other monitoring services.

Keywords:

Gitlab, Ansible, Terraform, Serverless, Cloudformation, lambda, Api Gateway, Cognito, ECS, EKS, Prometheus, Kibana,



6 MONTHS



2 POSITIONS

Email parsing and text classification through Machine Learning and Natural Language Processing

This project aims to build and train a Natural Language Processing model that extracts and classifies data from emails through classifiers and NLP cloud services. The extracted information will be used to automatically generate documents such as work certificate, bills, etc...

Main features:

- Conduct a comparative study between classification algorithms, ML NLP libraries and propose a project architecture.
- Become familiar with machine learning services on aws.
- Build and train a Model to parse emails and categorize them.
- Deploy the model on AWS cloud infrastructure.

Keywords:

Spacy, Scikit-learn, AWS Sagemaker, AWS Comprehend, AWS lambda, AWS Api Gateway, AWS Cognito.



6 MONTHS



2 POSITIONS

How To Apply?



Send your resume
with the internship number
by email :

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