Sébastien Doyez

✉ doyez.sebastien34090@gmail.com

☎ +33 6 43 81 38 57
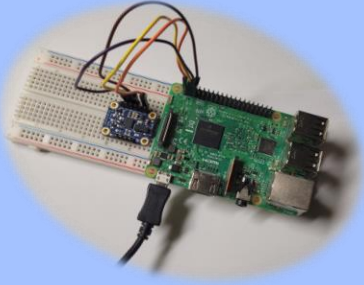
Engineering student

Electronics, Automation, specialty Robotics
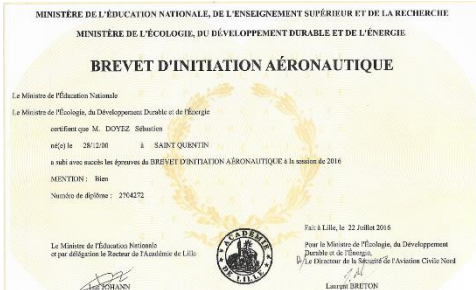
(Industrial computer science)

POLYTECH MONTPELLIER
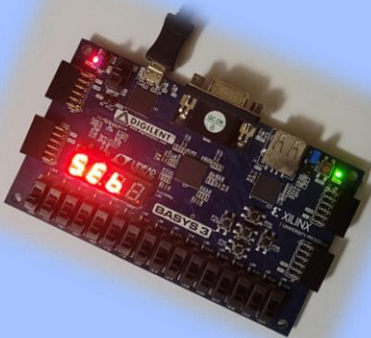
End-of-study Internship

(February 2024)

Biography :

After two years of preparatory classes in Douai, in the north of France, I am currently studying engineering at Polytech Montpellier. My passion for science was born from my earliest age: everything first it was my interest in aeronautics, which led me to do an internship at Stélia Aerospace, at the age of 14. Supervised by Mr Franck Darras and his team of engineers, I then took awareness of my vocation for engineering. This motivated me to pass my Aeronautical Initialization Certificate at the age of 15 years. For my Bachelor's degree, I presented a project on the planes of the future, where I had made a model of aircraft, assisted by the club of Fresnoy Le Grand, running on electric energy.

During my second year of preparatory school, I discovered my passion for robotics especially during the practical courses in Engineering Sciences. This led me to pass the entrance competition to Polytech Montpellier, a school specialized in field. The two internships that I did during my course did not fact that validating this interest in robotics and development software.

Outside of my studies, I have been skateboarding since I was 12 years old, a sport where you have to constantly question yourself, be patient and persevering, everything being aware of the risks.

This summer, I had the opportunity to discover the province of Quebec, in particular the city of Montreal, during an internship in partnership with Mitacs Globalink. This experiment was a revelation for me: I was deeply seduced by the wealth cultural diversity of the city, the diversity of its inhabitants as well as its economic dynamism. I was also impressed by the quality of career opportunities in the field of Engineering and Technology in Montreal. It is why I now want to settle in this city, while practicing my profession as an engineer there.

My skills :

My training allows me to work in many areas such as software development, robotics, automation and intelligence artificial. I also specialize in the design of an embedded system (electronics, mechanics, autonomy, automation).

Robotics & automation	Software	Human & soft skills
• Design and development of robotic systems • Use of languages of programming (C, C++, python, ROS2) • Image processing for the Perception in robots	• Development on microcontroller(Arduino, Raspberry pi, STM32) • Use of IDEs • Creation of IHM	• Motivation to achieve ambitious projects • Critical thinking • Effective communication of ideas and technical results • Creativity and autonomy
Programming an arm robotized by using Twincat *Using OpenCV for image processing and Perception*	*Design of a system client-middleware-server for simulate the sending of orders to a robotic arm*	*Practice of aeronautical modeling in club*

My works :

Here is a presentation of the work I have done during my course and my internships.
You will also find their GitHub directory containing their reports and their codes.

1) *Integration of machine learning algorithms in drones and rovers in Python.*
   Use of tensorflow and OpenCV librairies.

2) *Programming of an automated arm, screwdriver bottle of perfume.*
   Made for the company Sicos.

3) *Participation in the Cohoma II challenge.*
   In partnership with the French Army.

4) *Client-server system for sending remote control with a robotic arm..*
   Delayed command sending to an arm on CoppeliaSim

5) *Software part of a corporate pointer.*
   From the creation of the website to the integration of a database.

1) *Integration of Machine Learning algorithms into drones and rovers.*

The goal here was to respond to a rescue scenario in a risk (e. g. armed conflict).

To do this, we first created two models via the tflite model maker library, by tensorflow. The first is able to to detect a person to be rescued, and the second to detect the person via a camera view of the EP Core rover, in order to get a better position by relationship to the target.

Then we deployed them: the first one was used in a raspberry pi : the drone sends a video stream to it, and this microcontroller analyzes the images of this stream, via the object detection created. If a target has been detected, we send the coordinates to the rovers. We then used the SDK of rover to apply the model to the video from its camera. The aim here is to adjust the position of the robot in order to allow it to catch accurately, with the help of its grippers, the figurine representing a person in danger.

If you want to know more about this project the Github directory is located *here*, you will find the report of this internship as well as demonstration videos of the rover EP Core ans S1.

Python Programming on

Machine learning

IA

Tensorflow

2) Programming of an automated arm, screwdriver bottle of perfume.

 Aide Automatisme, a company made up of engineering consultant was tasked with automate a screwdriving arm for the company Sicos, specialising in the bottling of cosmetic products.

This arm came from the company Beckhoff, and I was fortunate to be able to program the bottle screwing cycle of perfumes via the twincat language.

I also made part of the HMI, including simple features such as emergency shutdown, indicators at the level of Sensors…

This project was carried out in cooperation with the engineers of the Beckhoff company, who have has been a valuable help.

I was also able to attend training on the XTS technology, these are carriers magnetically propelled, allowing a setting in quick operation as well as easy design.

The report on this project is available *here*.

Automation

Twincat

IHM

Robotics

3) *Participation in the Cohoma II challenge.*

Since 2021, Polytech Montpellier participates in the challenge Cohoma, in partnership with the French Army. The aim is to offer an innovative technical solution, semi-automated, suitable for military missions.

I had the chance to participate in one of the editions of this challenge. My mission was to perform a correction of GPS coordinates by merging them with the data of a IMU. These new data were to be easily accessible, we turned to ROS2.
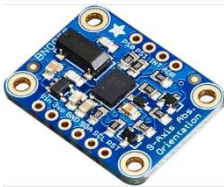
So I made several codes: two programs allowed us to extract the raw GNGGA coordinates and IMU data in publishing them on two topics. A third was the merger of data through the Kalman filter.

Finally I made a launch file, with the aim of simplifying the use of these algorithms.

You can find those works by clicking *__here__*.

ROS2

GPS

Data fusion

Linux environment

4) *Client-middleware-server system for sending remote control with a robotic arm.*

This project consisted of sent an order in position of a server towards an arm robotized, simulated on CoppeliaSim. The first server sends commands to middleware, which will introduce a delay in the transmission command and returns the same command to CoppeliaSim's server. Subsequently, I improved the system by allowing the user, with the 'd' and 'q' keys, to control the the position of the arm.

This project was carried out under the environment Linux, and allowed us to put in parallel some concepts of networks with automation.

The aim was to achieve a system that met the faster to control, without signal instability or exceedance.

The report, as well as the source code of this project is right *here*.
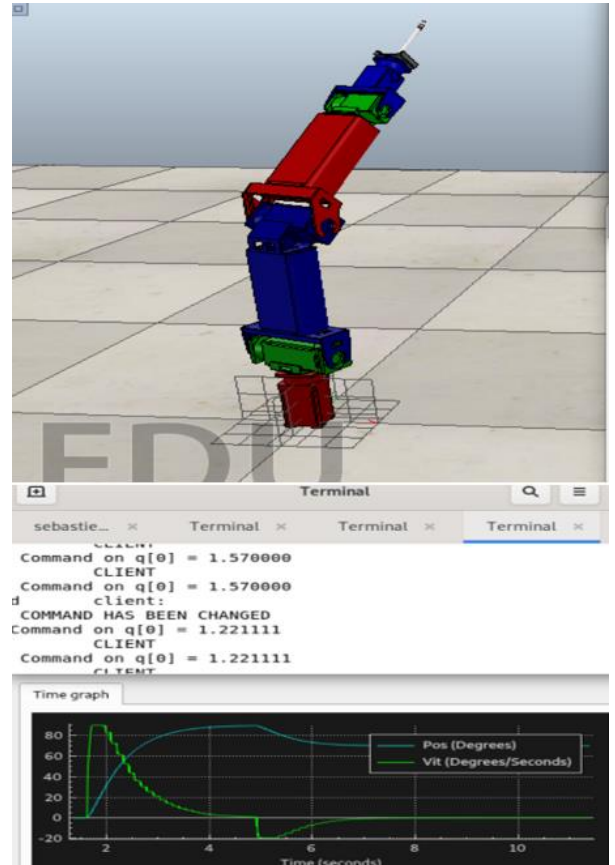
C / C++ language

Client-Server

Automation

Linux environment

5) *Software part of a corporate pointer.*

The aim of this semester project was to achieve a enterprise pointer, allowing the administration manage delays and absences, and employees to have an overview of the quota of hours delays and absences.

We were in pairs, I mainly occupied with the software part :

I created a website, coded in HTML and CSS, in order to to create a simple and pleasant interface, allowing you to connect as as a director or employee.
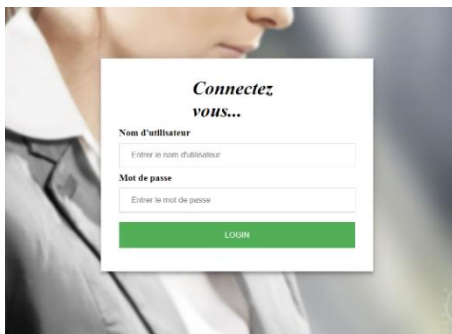
I then created a database that would be put to day by the pointer at each hour, according to the absences and delays. I then linked the site to this database via a Wamp server, using the SQL and PHP language.

The Github folder for this project can be found *here*.

SQL

HTML

CSS

PHP

Mamp serveur

My goal is to join your team and apply the skills I have acquired, in order to contribute to the success of your business in the Montreal area. I am available from February 2024.

Coordinates:

570 route de Ganges, 5.00.8,

34090 Montpellier (France)

+33 6 43 81 38 57

doyez.sebastien34090@gmail.com