Alexandre Clin Deffarges

PROJECT PORTFOLIO :

CURRENT PROJECT :

ROBOTIC RECOVERY MANEUVERS WITH REINFORCEMENT LEARNING – 02/2024 - 07/2024 –

Using Reinforcement Learning approach (teacher/student) to teach the ANYmal robot how to minimize damage during falls. With simulated environment, the robot learns optimal responses to reduce impact and the damage of the part of the robot.

SPATIAL REASONING FROM LLM FOR GLOBAL NAVIGATION – 02/2024 - 07/2024 –

In order to improve robot's navigation and to make it more versatile in various different environment, we are testing the spatial reasoning capabilities of large language models. The goal is to test whether the robot can have spatial reasoning with GPT-4 API and what is the strength and weakness of LLM, then test it with ANYmal robot.

PAST PROJECT :

START HACK, SAINT GALLEN – 20,21,22/03/2024 –

Participating in the Start Summit Hackathon 2024, we, a team of four, developed a realistic human voice chatbot for the canton of St. Gallen. Utilizing the data provided by the canton and from their website, we aimed to address the challenge they faced with hundreds of daily calls, most of which sought basic information or required redirection. Our solution, crafted over the three days, was designed to autonomously answer client inquiries, or ensuring accurate redirection for more specific questions.

ROBOTIC HAND PROJECT – 09/2023 - 01/2024 –

For a project at ETHZ, I develop with my team of 5 people an articulated robotic hand from scratch. Our goal is to create a functional robotic hand capable of grasping and manipulating objects within a budget of 250CHF. For this project, I apply my skills in robot design and simulation, robot fabrication, reinforcement learning, control and rigorous testing.

COMPUTER VISION PROJECT AND DEEP LEARNING PROJECT – 09/2023 - 06/2024

In a master's course at ETH Zurich, I executed several computer vision projects, including crafting a CNN model for image recognition, segmentation, and object tracking. Additionally, for others courses, I developed various deep learning models for music genre classification, graph neural networks, or natural language processing.

SORTING ARM ROBOT – 2019/2020 –

For my last year of high school, I had a scientific project in mathematic/technologie. For personal challenge, I learnt to program and 3D design and built a sorting arm robot with Arduino that sort 3 different size of cube.

INTERNSHIP AT THE SPACE DOMAIN – 05/2023 - 08/2023

During my internship at Solenix, I focused on space domain projects for the Swiss Army, calculating satellite deltaV and fuel consumption using historical data. I employed signal processing and machine learning in Python and Java for analysis and development.

OSCILLATOR DESIGN - 01/2022 - 06/2022

In an EPFL course, my team and I designed a 2-degree freedom oscillator for watches, resistant to linear and angular accelerations, using CATIA software.