Introduction

The purpose of the team design project is to design, model, simulate, and implement a 4-player robotic football team. This team will compete in a football match against other class teams at the end of the project term in April. The teams will compete within the RoboCup kid size rules and regulations.

## Scope

The expected outcome for this project will be for the team to design and implement software for a fully autonomous 4v4 football match. This will be done using NAO6 humanoid robots following the RoboCup kid size league guidelines. The three positions of striker, defender, and keeper will need to be developed with each having special goals and characteristics so the robots can work as a cohesive unit. The visual sensors of the NAO6 robot will be utilized to identify the target, their direction of play, and their teammates from their opponents. The robots’ actuators will be programmed so the robots move fluidly around the pitch, kick the ball, and stand up if knocked over. Before implementing software to the hardware, the team will need to create a simulated environment of the playing field as well as a digital twin of the players so the code can be tested and verified before being applied to the hardware. The project will finish with a formal report to recap the project, and a presentation presented by all group members as well as a demonstration of the working robotic football team.

## Operational Cost

The predicted man hours to be invested into this project is **XXXX** hours. The cost also accounts for the expected use of the lab to test the team’s software on the physical hardware. 40 lab hours have been estimated as well as 10% of the total time to be accompanied by expert help. The final spread for cost is **XXXX** hours at £100/hour and **XXXX** at £1000/hour. This project is estimated to cost £**XXX** for the **XXXX** hours of work.

* Operational Cost
  + Estimated time spent on the project in total by members (Total man hours at 100pounds/hour) à once everyone submits their hours for the first two weeks, extrapolate them out for the rough manhours spent over the two semesters.
  + Include expert help (1000 pounds/hour) à guess for at least 10% of total time to be accompanied by expert help.

## Timeline

The timeline this project is expected to be completed in is within the time frame of semester 1 and 2. The end date for the report and presentation is 15 April 2024.

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