SHORT Project title – Biped Walking Strategies

Descriptive project title – Developing walking algorithms for use on the NUgus platform and developing an interface to run open-loop trajectories from MatLab on the NUgus platform.

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Project description

NUbots are trying to develop a reliable gait for the NUgus Platform. Despite prior work and hardware changes to the NUgus platform, there is still no reliable walking gait. Additionally, there is no solution to run open-loop trajectories from MatLab on the NUgus hardware, which makes developing and deploying a walking gait a slow process.

In this FYP project, I have developed walking gaits for the NUgus Platform using both the Quasi-Static and Zero Moment Point approaches. To demonstrate these, I have created a MatLab function to communicate the joint value vector, during each timestep, via TCP. This will for rapid validation of walking strategies without having to translate MatLab into C++ first. Substantially, I have developed a novel method to generate a ZMP Reference from an arbitrary planar trajectory.

This work will provide NUbots with a reliable walking gait and the groundwork to enable the NUbots team to treat the entire walking problem as a simple API call.