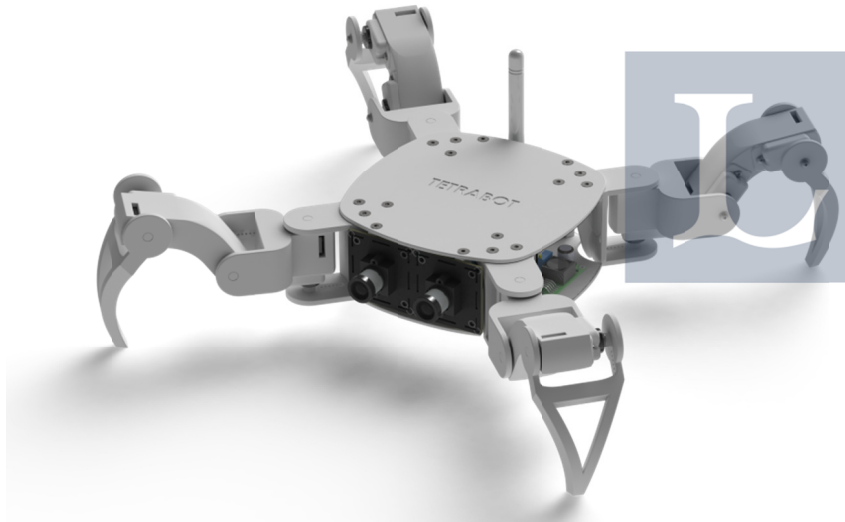


Development and Control of a Quadruped Robot

Master Thesis Proposal in Automatic Control



Indicative conceptual design of the TETRABOT

Legged walking robots have attracted considerable attention for several decades. However, only in the recent past have efficient walking machines been conceived, designed and built with performances that can be suitable for practical applications. Legged robots can overcome obstacles that create a structural challenge for classic wheel-based robots. Multi-legged walking robots also benefit from a lower impact on the terrain and have greater mobility in natural surroundings, which is especially important for use in exploration of remote locations and hostile environments.

In this master thesis the participants will have to develop and control a quadruped robot (TETRABOT). The developed setup will possess the ability of:

- Independently moving its 12 degrees-of-freedom for the undertaking of walking/turning motion patterns,
- Automatically balancing its base structure independently of the legs' postures,
- Generating feasible trajectories via the use of various sensors with obstacle avoidance capabilities.

Angular, orientation, and other required measurements will be acquired with the utilization of various sensors (IMUs, Cameras, VICON).

- No. of Participants: 1 – 2 Students
- The development of the TETRABOT will require the handling of various mechanical and electronic components (motors, microprocessors, cameras & other sensors etc.)
- The programming of the TETRABOT will require the use of various software packages (Matlab, ROS, LabVIEW) and various operating systems (Windows, Linux, Arduino etc.)
- Knowledge in computer-aided-design (CAD) and Rapid Prototyping (3D Printing) will be considered a plus.
- Guidance will be provided by the supervisors on a weekly discussion basis.

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