Quadruped Robot Locomotion
(Gait Analysis and Dynamic Leg Trajectory Planning of Quadruped Robots)

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ABSTRACT:

Mobile robots are often used to inspect an environment or move objects from one place to another. This is a crucial application of robots in the office, military, hospital and factory floor applications. The first issue affecting mobile robots is locomotion. Although their motion usually takes place in known, controlled environments like a factory, department stores, and so on, on other occasions they have to move in dangerous, in delicate, and extreme environments. There are some instances whereby conventional wheeled robots are not the best choice. Wheeled robots cannot navigate well over obstacles, and this is the main drawback of this type, depending on the terrain, such as rocky terrain, sharp declines or areas with low friction.

Due to it's geographical location, environmental hazards etc, part of the earth's landmass may be inaccessible to humans. Four-legged robots, also referred to as quadruped, can have very sophisticated locomotion patterns and provide means of navigating on surfaces where it seems impossible for wheeled robots.

This project is to develop a reliable solution that enables the implementation of stable and fast static/dynamic walking of quadruped robots on even and uneven terrain. The robot captures/mimics the mobility, autonomy, and speed of four-legged living creatures. The robot moves with different gait types and uses an imu-sensor embedded in it for detecting slope in terrain changes.

BIOGRAPHY:



Omer Kurkutlu is a robotic enthusiast working as one of the youngest Robotics Software Engineer at Kontrolmatik Technologies and also a researcher who has developed a quadruped robot called OK1 Robot. His research is focused on dynamic motion planning and control of Quadruped Robots. He has also made research contributions to different gait state estimations for four-legged animals in order to develop quadruped robot locomotion. During his final year of graduation in India, his project, Quadruped Robot, was selected as one of the best final year projects of graduating students. In addition, He has worked in the industry to design and control of the Collaborative Robots, where scope was applied to gravity compensation, free drive, safety mode, and collision detection of the robot.

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