

Active and passive compliance mechanisms in legged robot locomotion

ABSTRACT

Legged robot locomotion is a challenging field. Problems can occur during locomotion such as morphology, controller, and ambience factor, to name a few. However, there are always trade-offs in designing legged robots, for example, speed against stability, number of limbs against complexity of controller, and mass of the robot against energy consumption of the actuators. Therefore, the problems can be minimized when the hardware and software complement each other. Active compliance mechanism describes a closed-loop system which actively sense-and-act according to the surroundings. Passive compliance mechanism, as its name suggests, is a regulatory mechanism in which it does not rely on the controller to actively respond in order to achieve adaptability. The composition materials of a legged robot provide the advantages during locomotion. In this review, we are going to investigate the differences of the mechanisms and how they can be complemented to diminish problems during locomotion.

Keyword: Active compliance mechanism; Legged robot; Locomotion; Passive compliance mechanism