

LOCAL STABILITY ANALYSIS OF PASSIVE DYNAMIC BIPEDALROBOT

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ABSTRACT

The bipedal walking is the main form of locomotion of human kind. The human body is flexible and so it is easy for humankind to steadily walk on the different terrain, however building a robot to have a human-like gait is not easy due to the complex dynamics of the walking. In this paper, we focus the passive dynamic bipedal robot (PDBR) which walks only by the pre sent of gravity on an inclined ramp, that is, the robotics walking on a ramp in absence of external forces. We describe a general method for deriving the equations of motion and impact tequations for the analysis of walking models. Application of Poincare fixed point method to analyse the stability of a symmetric gait after the small disturbance in the fixed point. It used to understand, how much disturbance is allowed for the stable cyclic motion.

KEYWORDS: Bipedal Robot, Passive Walking, Linearization, Switched Conditions, Compass Gait, Orbital Stability, Poincare Map, Phase Space Diagram