

# **Design and Build of a Passive Walker Biped**

By: S.M.Hadi Sadati

## **Abstract:**

Passive walkers are robots, which perform a walking like, stable limit cycle on small slopes without any external control. This concept was published on 90's by McGeer and there are lots of related researches going on in the past few years. Keeping in mind the novelty of the concept, investigating the effects of structural parameters on walking performance and finding their optimums, simulating the biped and establishing a trend to its optimal design and build, and finally doing experimental researches, would be of a great concern.

In this research, a deployed model of biped that can be built has been considered, and then its walking performance sensitivity such as efficiency, stability and robustness on uneven terrain due to variation of structural parameters and their optimum limits have been investigated. It was shown that the foot arc radius and center of mass height have the most important effect on walking performance. After comparing the results with previous researches and doing simulations in MSC.ADAMS software, an optimum design trend has been suggested. At the end based on experimental results, it was shown beside optimization of structural parameters, considering the impact condition as well would be very important to achieve optimal walking.