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减重步行训练机器人步态规划方法的研究 [点此下载全文](#)

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摘要:

目的: 探讨减重步行训练机器人的步态规划方法。方法: 设计了3组健康人步态分析实验, 包括步长不变、改变步频行走实验、步频不变、改变步长行走实验和电动跑步机与平地行走对比实验, 并对7名健康实验者的步态轨迹数据进行对比分析。结果: 将髋膝关节角度曲线对步态周期进行归一化处理后, 通过对比分析得出如下规律: 步长不变、改变步频时步态轨迹不发生改变; 步频不变、增大步长时步态轨迹中髋膝关节角度曲线随之呈非线性增大; 电动跑步机与平地行走时步态轨迹基本相同, 可用平地步态轨迹对减重步行训练机器人进行步态规划。结论: 可以利用一组标准参考步态轨迹来进行减重步行机器人的步态规划, 通过改变有关参数来产生不同步频和步长的运动轨迹, 从而满足康复训练的要求。

关键词: [减重步行训练](#) [步态规划](#) [机器人](#)

Gait programming algorithm for the gait training robot used in PBWST [Download Fulltext](#)

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Fund Project:

Abstract:

Objective: To explore a kind of gait programming algorithm for the gait training robot used in partial body weight support training(PBWST). Method: Seven healthy adults completed gait analysis comparative experiments in 3 different situations: first, changing step frequency with constant step length; second, changing step length with constant step frequency; third, walking on treadmill and ground. Result: According to comparative analysis of the data normalized with gait cycle, 3 rules were obtained: if step length was kept constant, the gait trajectory was affected little by the change of step frequency; if step frequency was kept constant, the angle curve of hip and knee increased nonlinearly with the accretion of step length; treadmill gait and ground gait were basically the same. Conclusion: On the basis of these rules, it indicates that a set of standard reference data of gait trajectory can be used for the gait programming of gait training robot used in PBWST. Using this approach, new gait trajectories for different requirements of gait frequency or gait length are generated rapidly by changing related parameters.

Keywords: [partial body weight support training](#) [gait programming](#) [robot](#)

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