Thesis title: may be long or short

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Abstract

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1 Introduction

The purpose of this project was to reimplement the work done by Yin, Loken and van de Panne in their 2007 paper on simple biped locomotion control using a newer physics simulator [4]. [3] [1] [2]

2 Methods

3 Results and Discussion

4 Conclusion

5 Further Works

The simple biped locomotion control presented in this paper can easily be expanded into many avenues for further works. The first and most obvious of which is to control the motion in 3D instead of the 2D model presented here. Removing the constraint on the body would introduce another dimension of balance control that would need to be implemented and optimized, allowing for steps to the side to help keep the figure upright. When working with this 2D model one could use optimization routines to try and find the set of parameters which produces the longest upright walking time. Stochastic policy search, cyclic coordinate decent and covariance matrix adaptation are all methods that could be applied to finding the particular balance parameters, cd and cv for optimal walking. Another expansion of this model is different gaits and walking terrain. For example running, walking with high knees, jumping, and even more complex movements could be implemented using the finite state machine framework. Furthermore inclined or bumpy terrain as well as external forces acting on the body could be used to further push the balance and locomotion control. Finally models like these can be used to bridge the gap between simulation and reality. The locomotion control can be applied to real life robots and these models can help guide the way in which their locomotion is developed.

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A Code

B Code Documentation

References

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