

The Dynamic Postural Adjustment for the Human Body Model

The postural balance system is one of the most fundamental functions for humanoid robot control. We propose a new feedback balance control system for the human body model. Our system finds the optimal motion for maintaining balance in the 3D space without receiving any feed-forward input beforehand. Two different strategies are adopted for the optimization: the quadratic programming method and the PD control.

The use of this system enables the model to maintain its balance against large perturbations. Comparison of simulation results with real human motion reveals many common features such as rotating arms.

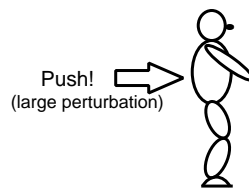


Figure 1: Now, we think the situation that the force is applied from the backward direction.



Figure 2: Real humans usually keep their balance by rotating their arms and bending down.

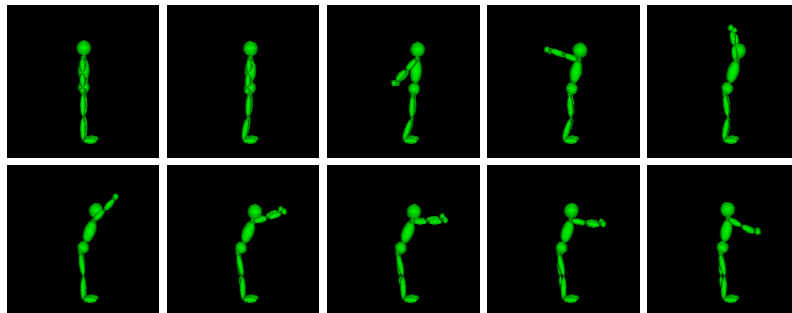


Figure 3: In the simulation, motions which are similar to real human motions appeared.

Publication:

Shunsuke KUDOH, Taku KOMURA, and Katsushi IKEUCHI, "The Dynamic Postural Adjustment with The Quadratic Programming Method", IROS2002.