

Stance postural control in consideration of neurological time delay based on a musculoskeletal model

To understand complicated stance postural control mechanism, realization of biped stance motion of a musculoskeletal model which is controlled by a physiologically plausible neural controller is important. Most previous studies adopted inverted pendulum model to represent human body, neglecting the complexity of human musculoskeletal system. Besides, neurological time delay, which has great influence on posture stability, was neglected and should be discussed deeply.

In this research, we focused on human musculoskeletal system and neurological time delay, which are two important elements in posture control. We proposed a neural controller (Fig. 1) to keep a musculoskeletal model with 70 muscles standing under 100ms delay. Through the forward dynamics simulation, we validated whether the proposed controller could keep musculoskeletal model standing. In the future, we will discuss influence of feed-forward control, one of the components of neural controller besides feedback control, on postural stability.

Keywords: Postural control, Musculoskeletal model, biological simulation

References

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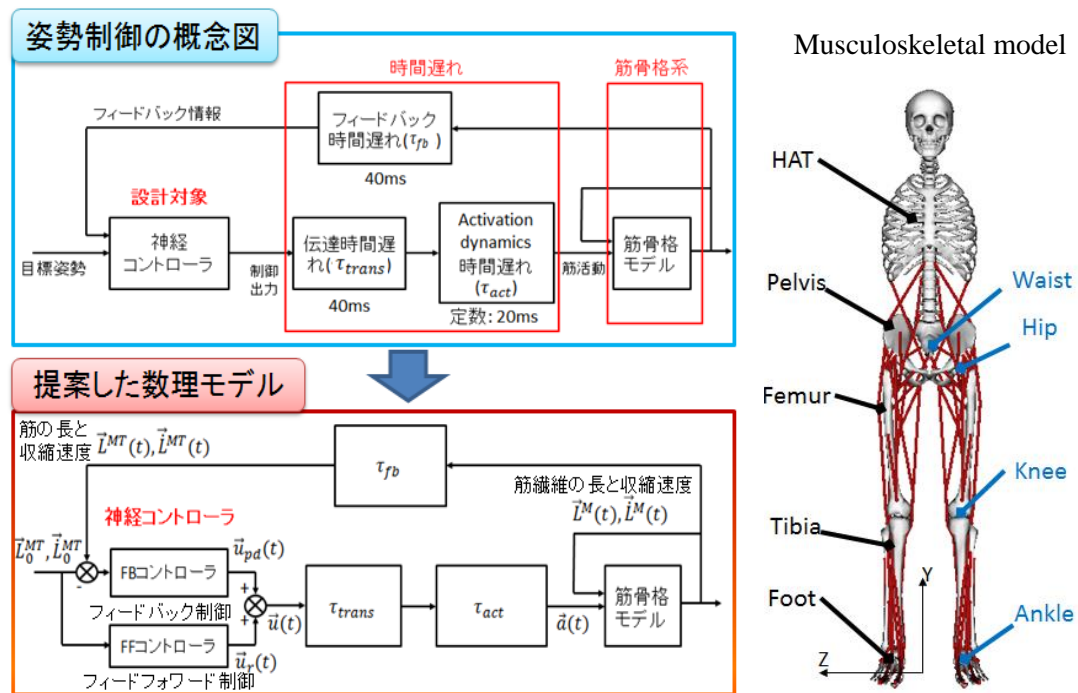


Fig.1 Stance postural control model