B-H. Yu, K-Y. Park, K-D. Lee, C-S. Han. ***Static compensation ZMP algorithm to prevent tip-over of a tele-operation excavator.*** *Gerontechnology 2012;11(2):426;* doi:10.4017/gt.2012.11.02.431.00

Purpose Research on tele-operated excavators that protect the operator from the risk of tip-over excavators in hazardous working areas has increased in popularity. The tele-operated excavator is able to protect workers from risks in hazardous working areas, but the operator cannot directly access the tip-over information from the tele-operated excavator. We propose the static compensation ZMP (Zero Moment Point) algorithm for preventing excavator tip-overs. **Method** Firstly, kinematic and kinetic analysis of the excavator was performed[1,2]. Secondly, static compensation ZMP algorithm, which uses ZMP algorithm to determine gait stability of a biped walking robot[3,4], was developed to prevent tips-over of tele-operation excavator. Static compensation ZMP-algorithm minimizes ZMP-error due to rapidly changing excavator acceleration using the center of gravity through a static compensation algorithm. Finally, the result of the proposed algorithm is simulated by RecurDyn model with Matlab Simulink co-simulation method. **Results & Discussion** In the simulation result ZMP has been compared to static compensation ZMP-algorithm using an excavator dynamic model (*Figure 1*). From these results we see that the ZMP value is bigger than the static compensation ZMP. This means that the general ZMP is disturbed due to rapidly changing excavator acceleration. This problem is minimized by the static compensation ZMP-algorithm.

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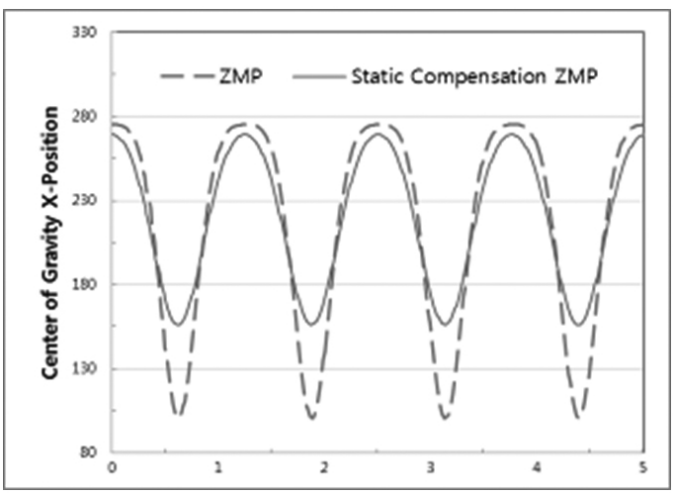

Figure 1. The ZMP and Static Compensation ZMP simulation position data from the RecurDyn Excavator Model