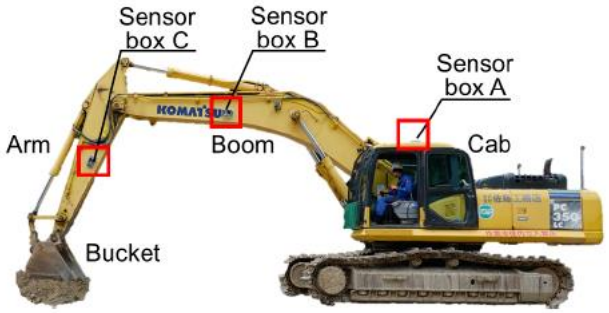
Tohoku Univ. Technology

Prediction method of loading timing of sediment by backhoe

Effective collaboration between backhoe and dump trucks

Sensor box mounting position



Overview

In order to realize the automation of the loading work of sediment from the backhoe to the dump truck, it is necessary not only to predict the stop position of the dump truck with respect to the backhoe, but also to predict the timing when the backhoe completes the preparation for loading. By moving the dump truck according to the loading timing, the unnecessary waiting time can be reduced, and the loading work can be realized smoothly. However, it is difficult to distinguish these work processes because the back hoe includes the same operation (For example, the action of scooping up soil and sand or the action of turning) when leveling sediment and loading.

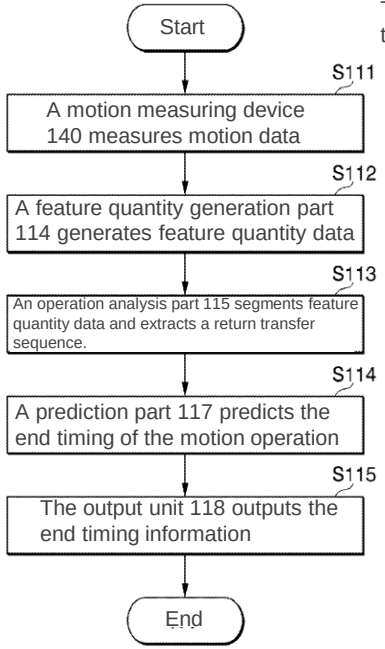
In the present invention, motion data are obtained from sensors attached to the back hoe at multiple locations, and a hidden Markov model (BP-HMM) can be used to extract patterns of primitive operation and predict loading timing.

Product Application

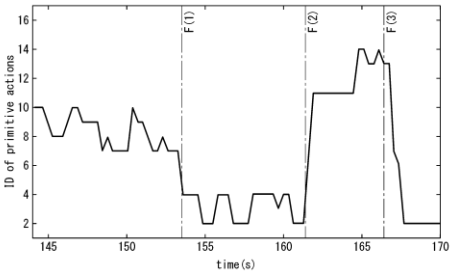
- Construction equipment
- Civil engineering field

Features・Outstandings

[Timing prediction processing]



【 Transitions in primitive behavior during preloading 】
The preparatory work operation represents a state transition segmented into 14 states.



IP Data

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