

# Development of walking ability classification system

Kei Kinoshita<sup>1</sup> (E-mail: kei-k@vib.me.ynu.ac.jp), Hajime Takada<sup>1</sup>,  
Yoshifusa Matsuura<sup>1</sup>, Shigeo Takizawa<sup>2</sup>

<sup>1</sup>Yokohama National University <sup>2</sup>Biophilia Institute of Rehabilitation Inc

Key words: *horizontal walking, force plate, classify the walking ability*

## SUMMARY

It is our goal to decrease the number of people who need nursing to solve various problems in the elderly community. Therefore the increase of rehabilitation for people who are not able to walk is hoped for. It is a difficult problem because rehabilitation is done by a physical therapist's qualitative evaluation based on his/her own professional experience and educational training. So in our study, we quantified horizontal walking and analyzed the correlation between walking ability evaluations done by physical therapists and parameters of horizontal walking. Based on this data, we developed the system that classifies walking ability.

## METHOD

We selected the force plate as a measurement device with a design that doesn't put a strain on the subject as shown in Fig. 1.

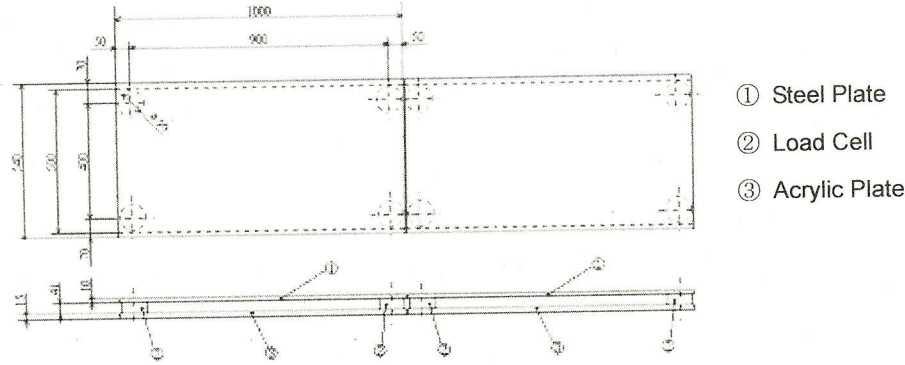


Fig. 1 Force Plate

Patterns of the force action point can be obtained from the data output from the force plate. The starting point and the end point of the single stance phase are extracted as shown in Fig. 2. As a result, time, distance and force parameters that compose horizontal walking can be obtained.

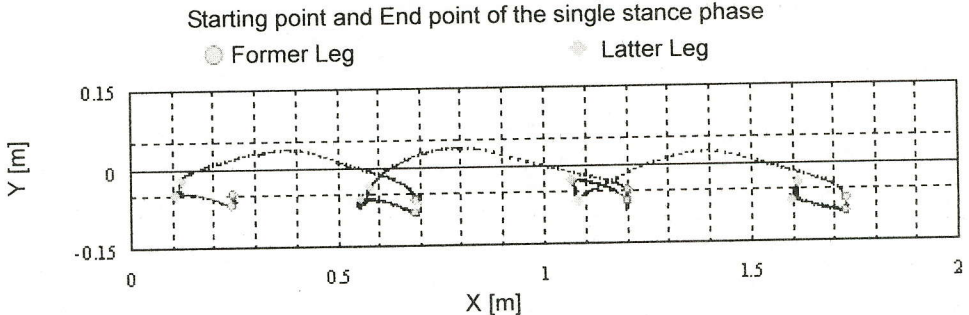


Fig. 2 Patterns of the force action point and feature points

## RESULT

We developed the system to classify walking ability by using effective parameters. The hitting ratio with walking ability evaluation by physical therapist is 60.9%.