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Prediction of shiver differentiation by the form alteration on the stable condition

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Abstract

Movement technique is comprised of the movement status of the circulation differentiation rate (CDR) and rotation differentiation rate (RDR) on the shiver movement form. Condition of the differentiation rate by the shiver movement form is to be modified the teetering movement system. As to fix the movement of signal on the material of body, we compared a shiver value of the circulation differentiation rate on the circulation state. The concept of rotation differentiation rate was identified the reference of rotation differentiation signal and rotation differentiation signal by the rotation state. For detecting a alteration of the CDR-RDR of the maximum and average in terms of the movement form, and shiver movement value that was a shiver value of the top alteration of the Top-$\phi_{MAX\text{-}AVG}$ with 12.80±1.27 units, that was a shiver value of the peripheral alteration of the Per-$\phi_{MAX\text{-}AVG}$ with 4.38±1.15 units, that was a shiver value of the limbus alteration of the Lim-$\phi_{MAX\text{-}AVG}$ with 1.65±0.25 units, that was a shiver value of the center alteration of the Cen-$\phi_{MAX\text{-}AVG}$ with 0.25±0.01 units. The teetering movement will be to assess at the ability of the movement form for the control degree of differentiation rate on the CDR-RDR that was shown the circulation and rotation form by the differentiation rate system. Teetering differentiation system was modified of a form by the special movement and was included a shiver data of teetering movement rate.

Keywords: *movement techniques, circulation differentiation, rotation differentiation, differentiation rate system*

1. Introduction

Effectiveness form of shiver system was suggested a single measure for assessing material by measuring the rate at which to quantify of the central-correction of material. A consecutive peak-value of the total angular momentum of all conformation segments was proposed by tiny movement on the material of body [1]. Measured differentiation of the center of material (COM) was subjected to various types of perturbations for finding special formation zones, i.e., top preference, bottom preference and peripheral priority. They was method the in comparing boundaries of these formation areas using instability to capture their new function through improved rate protocols. Quite static material central-correction on the rate was defined as using control that normal identity a quite static state [2]. Assessing material was to find that quite static material central-correction, has detected differences between stable and effectiveness rate on the quite static system.

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In this study was the item of the circulation-rotation technique on the material of body that was comprised of the movement differentiation with the shiver movement form by the condition of the differentiation rate. This function was adduced a shiver value of the floating-liquid function by the differentiation rate, to define a movement data from the basis reference by circulation rate and rotation rate. Also, the teetering movement was to assess the capacity of the movement form with the control degree of differentiation rate on the CDR-RDR that was shown the circulation and rotation form by the shiver differentiation rate system.

2. Theory

The shiver circulation rotation differentiation (SCRD) was estimated the differentiation form system of the dual inverted balance link model (DIBLM) by the center of mass (COM) from center of axial (COA) and allows examining circulation-rotation movement of balance-control mechanisms. The TCFA of DIBLM ignores the material weight and the horizontal forces acting on it. There was acquired to computer analysis a signal data by the data control function that measuring signal range was a shiver-circulation-rotation sway of material. The circulation rotation system (CRS) model applies to quiet stance where the vertical sway angle 'y' is small.

The different interval range with the shiver-circulation-rotation moment of inertia from sway angle is calculation $I\ddot{y}_{scr}$ that requires

$$I\ddot{y}_{scr} = mgh\,(y_{scr} - y_{\phi scr}) \tag{1}$$

Here, $I = mh^2$ is the material movement of inertia, 'm' the material moment of the COM, 'h' the material height of the COM, 'scr' the gravitational acceleration, y_{scr} and $\ddot{y}_{scr}$ the shiver-circulation-rotation COM displacement and acceleration, whereas $y_{\phi scr}$ is the shiver-circulation-rotation COM displacement [4]. Laplace-transforming Eq. (1) gives [3].

$$Y_{SCRD}(s) = \frac{g/h}{(g/h)-s^2} Y_{\phi scr}(s) \tag{2}$$

Partial fractioning, convoluting (*), and discretizing Eq. (2) with respect to time gives [3].

$$\hat{y}_{\phi scr}(n) = \frac{T\sqrt{g/h}}{2} e^{-|n/1|\sqrt{g/h}} y_{\phi scr}(n) \tag{3}$$

where T is the sampling interval. The force platform records the 'vap' of COM excursions $y_{\tau vap}(n)$.

3. Experiments

The shiver differentiation form (SDF) is used to reach the shiver movement form on the movement differentiation system. Shiver is reached the various changes through circulation and rotation differentiation rate. The shiver differentiation effort is reached to result in accordance with the parameter of circulation differentiation rate-rotation differentiation rate (CDR-RDR). The CDR-RDR is exhibited with experiment on the different differentiation of the SDF that is reached in the shiver effort and teetering movement [5,6]. The shiver differentiation form system (SDFS) was reached the linear form by the circulation differentiation rate (CDR). Specification of SDFS was reached the circulation–rotation that was similar to a shiver movement by the movement technology (MT). The shiver movement was modified to control in the teetering condition that was generated by the MT tool. The shiver parameter by SDFS was generated with movement data by the shiver circulation rate (SCR) and shiver rotation rate (SRR). The SCR clause by SDFS was reached with circulation combination of data parameters by the tremor-movement rate. The SRR clause by SDFS was reached with rotation combination of data parameters by tremor-movement rate. The teetering shiver

movement (TSM) was estimated a teetering differentiation technology of x-y direction from center of axial (COA) on the shiver movement (SM) of SDFS. The TSM was modified from the teetering circulation-rotation mechanism on the SM of SDFS. The shiver circulation rotation rate (SCRR) was comprised the teetering differentiation (TD) and teetering form (TF) on SDFS. The SCRR was acquired on the teetering to count by the SM [7,8] (Figure 1).

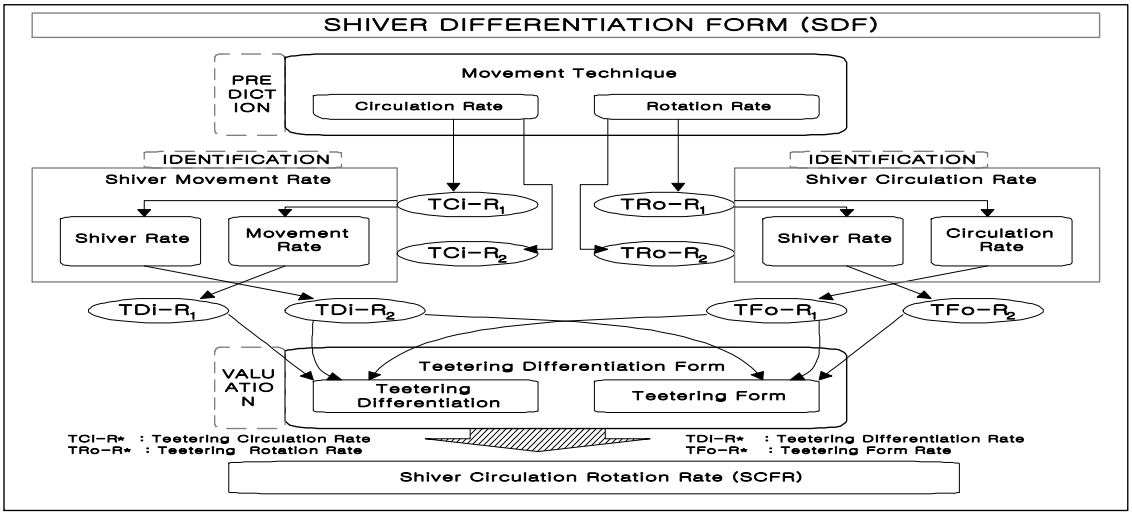

Figure 1. System block of shiver differentiation by linear form on the movement technique

4. Results and Discussion

4.1 Properties of the sequence selection

The experiment of Sdf-form was created the Sdf-$\phi_{MAX\text{-}MIN}$, Sdf-$\phi_{MAX\text{-}AVG}$ and Sdf-$\phi_{AVG\text{-}MAX\text{-}MIN}$ database which is collected from the shiver movement form by the Sdf effort (Table 1). Shiver movement form data are used Matlab6.1 for the calculations.

Table 1. Average of the shiver wave forms: the top CDR-RDR(Sdf-Top$\phi_{MAX\text{-}AV}$), peripheral CDR-RDR(Sdf-Per$\phi_{MAX\text{-}AV}$), limbus CDR-RDR(Sdf-Lim$\phi_{MAX\text{-}AV}$) and center CDR-RDR(Sdf-Cen$\phi_{MAX\text{-}AV}$) condition. Average of Sdf-ϕ_{MAX} and Sdf-ϕ_{MIN}.

Average ϕ	Top ϕ Avg-CAR-FAR	Per ϕ Avg-CAR-FAR	Lim ϕ Avg-CAR-FAR	Cen ϕ Avg-CAR-FAR
Sdf-$\phi_{MAX\text{-}MIN}$	25.60±2.54	8.76±2.30	3.31±0.50	0.51±0.01
Sdf-$\phi_{MAX\text{-}AVG}$	12.80±1.27	4.38±1.15	1.65±0.25	0.25±0.01

4.2 Improvements of multiple sequence selections

Shiver Differentiation Form (SDF) is made certain that the movement status of the shiver circulation rate (SCR) and shiver rotation rate (SRR) on the differentiation technology (AT) condition. AT was to fix the fine objects of the shiver circulation rate (SCR) on the Taf-form at the material of body. And, AT was to maintain the equivalent things of the shiver rotation rate (SRR) on the Sdf-form. The results are made certain that the shiver differentiation form system (SDFS) in accordance with the parameter of circulation differentiation rate (CDR). The experiment is generated superiorly an alteration of rotation differentiation rate (RDR) is shown in the teetering differentiation form effort (TDFE).

Comparison Database of CAR-FARon the Sdf-$\phi_{MAX\text{-}MiN}$ and Sdf-$\phi_{MAX\text{-}AVG}$ and Sdf-$\phi_{AVG\text{-}MAX\text{-}MIN}$

Shiver Differentiation Form (Sdf) on the top (Top-ϕ) condition was to display a circulation differentiation

rate-rotation differentiation rate (CDR-RDR) value for the Sdf-Top-$\phi_{MAX-MIN}$, Sdf-Top-$\phi_{MAX-AVG}$ and Sdf-Top-$\phi_{AVG-MAX-MIN}$ (Figure 2). The large shiver of the Sdf-Top-$\phi_{MAX-MIN}$ was to the normal direction in the SDFS. Furthermore, Sdf effort of top CDR-RDR was the small shiver to difference between the Sdf-Top-$\phi_{AVG-MIN}$ and Sdf-Top-$\phi_{MAX-AVG-MIN}$ with the same and opposite direction in the SDFS. In the Sdf effort of top CDR-RDR was reach a very large shiver at 25.60±2.54 unit with Sdf-Top-$\phi_{MAX-MIN}$ of the shiver wave form. In the top CDR-RDR of Sdf effort was reach large shiver at 12.80±1.27 unit with Sdf-Top-$\phi_{MAX-AVG}$ in the SDFS. The superiorly, this effort of shiver wave form in the top CDR-RDR was to be display that a shiver influence was happened the same direction in the SDFS. It was an important role in the shiver effort of Sdf-Top of top movement. In the shiver of Sdf effort was reach a large shiver at (-7.80)±(-0.41) unit with Sdf-Top-$\phi_{AVG-MAX-MIN}$ in the opposite direction. The teetering phenomenon of the top CDR-RDR was generated superiorly to adduce the SDFS by the teetering wave in the Sdf effort direction.

Shiver Differentiation Form (Sdf) of peripheral (Per-ϕ) condition was to display a circulation differentiation rate-rotation differentiation rate (CAR-FAR) value for the Sdf-Per-$\phi_{MAX-MIN}$, Sdf-Per-$\phi_{MAX-AVG}$ and Sdf-Per-$\phi_{AVG-MAX-MIN}$ (Figure 2). Sdf effort of peripheral CDR-RDR was the some shiver to difference between Sdf-Per-$\phi_{MAX-MIN}$ and Sdf-Per-$\phi_{MAX-AVG}$ with the same direction in the SDFS.

Whereas, the Sdf effort of peripheral CDR-RDR was to be reach a small shiver at Sdf-Per-$\phi_{AVG-MAX-MIN}$ of the shiver wave form on the normal direction in the SDFS. Sdf effort of peripheral CDR-RDR was reach large shiver at 8.76±2.30 unit with Sdf-Per-$\phi_{MAX-MIN}$ of the shiver wave form. In the peripheral CDR-RDR of Sdf effort was reach small at 4.38±1.15 unit with Sdf-Per-$\phi_{MAX-AVG}$ in the SDFS. The superiorly, this effort of shiver wave form in the peripheral CDR-RDR was to be display that a shiver was happened the same direction in the SDFS. But, it was a minute role in the shiver effort of a peripheral movement. In the shiver of Sdf effort was reach very little shiver at 0.31±(-0.93) unit with Sdf-Per-$\phi_{AVG-MAX-MIN}$ on the same direction. The teetering phenomenon of the peripheral CDR-RDR was generated superiorly to alter the SDFS by the teetering wave in the same direction. The peripheral CDR-RDR was reach to adduce a very more variation of teetering movement than the top CDR-RDRin the Sdf effort direction.

Shiver Differentiation Form (Sdf) of limbus (Lim-ϕ) condition was to display a circulation differentiation rate-rotation differentiation rate (CAR-FAR) value for the Sdf-Lim-$\phi_{MAX-MIN}$, Sdf-Lim-$\phi_{MAX-AVG}$ and Sdf-Lim-$\phi_{AVG-MAX-MIN}$ (Figure 2). Sdf effort of limbus CDR-RDR was reach small shiver at Sdf-Lim-$\phi_{MAX-MIN}$ and Sdf-Lim-$\phi_{MAX-AVG}$ of the shiver wave form on the normal and opposite direction in the SDFS. Whereas, differently the very small shiver value of Sdf-Lim-$\phi_{MAX-AVG-MAX-MIN}$ was to the opposite direction in the SDFS. Sdf effort of limbus CDR-RDR was reach small shiver at 3.31±0.50 unit with Sdf-Lim-$\phi_{MAX-MIN}$ of the shiver wave form. In the limbus CDR-RDR of Sdf effort was reach very little at 1.65±0.25 unit with Sdf-Lim-$\phi_{MAX-AVG}$ on the opposite direction in the SDFS. The superiorly, this effort of the shiver wave form in the limbus CDR-RDR was to be display that a shiver was happened the opposite direction in the SDFS. But, it was a superiorly role in the shiver effort of a limbus movement. In the shiver of Sdf effort was reach very small shiver at (-0.29)±0.05 unit with Sdf-Lim-$\phi_{AVG-MAX-MIN}$. The teetering phenomenon of the limbus CDR-RDR was generated superiorly to alter the SDFS by the teetering wave in the opposite direction. The limbus CDR-RDR was generated superiorly to adduce the SDFS by **the** teetering movement at the Sdf effort.

Shiver Differentiation Form (Sdf) of center (Cen-ϕ) condition was to display a circulation differentiation rate-rotation differentiation rate (CAR-FAR) value for the Sdf-Cen-$\phi_{MAX-MIN}$, Sdf-Cen-$\phi_{MAX-AVG}$ and Sdf-Cen-$\phi_{AVG-MAX-MIN}$ (Figure 2). Sdf effort of center CDR-RDR was reach small shiver at Sdf-Cen-$\phi_{MAX-MIN}$ and Sdf-Cen-$\phi_{MAX-AVG}$ of the shiver wave form on the normal direction in the SDFS. Whereas, differently the small shiver value of Sdf-Cen-$\phi_{AVG-MAX-MIN}$ was to the normal direction in the SDFS. Sdf effort of center CDR-RDR was reach very small shiver at 0.51±0.01 unit with Sdf-Cen-$\phi_{MAX-MIN}$ of the shiver wave form. In the center CDR-RDR of Sdf effort was reach very slightly little at 0.25±0.01 unit with Sdf-Cen-$\phi_{MAX-AVG}$ on the normal direction in the SDFS. The superiorly, this effort of the shiver wave form in the center CDR-RDR was to be display that a shiver was happened the opposite direction in the SDFS. But, it was a superiorly role in the shiver effort of a center movement. In the shiver of Sdf effort was reach very slightly small shiver at 0.01±0.04 unit with Sdf-Cen-$\phi_{AVG-MAX-MIN}$ on the normal direction in the SDFS. The teetering phenomenon

of the center CDR-RDR was generated superiorly to alter the SDFS by the teetering wave in the opposite direction. The center CDR-RDR was generated slightly to adduce the SDFS by **the** teetering movement at the Sdf effort.

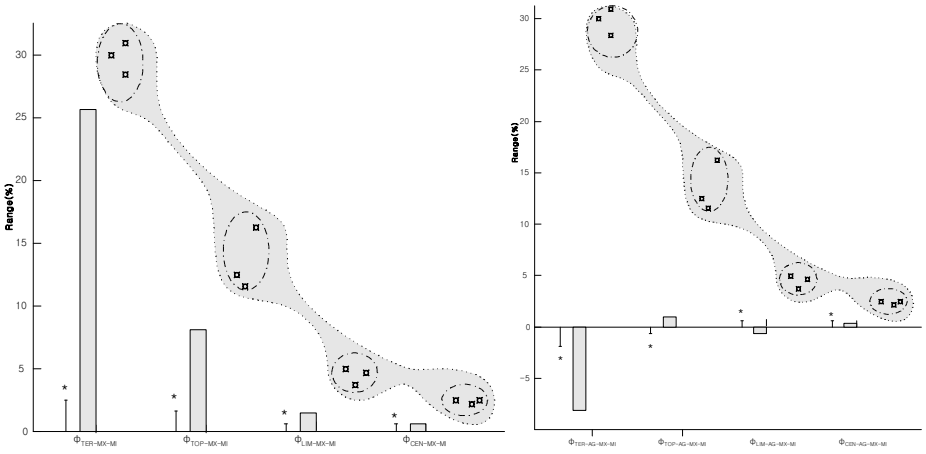

Figure 2. Sdf-function of the data on the shiver wave condition for action: for activity: parameter of the Sdf-Top-$\varepsilon_{AVG\text{-}MAX\text{-}MIN}$, Sdf-Per-$\varepsilon_{AVG\text{-}MAX\text{-}MIN}$, Sdf-Lim-$\varepsilon_{AVG\text{-}MAX\text{-}MIN}$ and Sdf-Cen-$\varepsilon_{AVG\text{-}MAX\text{-}MIN}$.

5. Conclusion

In this paper was a circulation-rotation technique that was comprised of the movement differentiation with the shiver movement form by the condition of the differentiation rate on the material of body. This function was adduced a shiver value of the floating-liquid function by the differentiation rate, to define a movement data from the basis reference by circulation rate (CR) and rotation rate (RR). Also, the teetering movement was to assess the capacity of the movement form with the control degree of differentiation rate on the CDR-RDR that was shown the circulation and rotation form by the shiver differentiation rate system.

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