

CLAIMS

1. A processor-implemented method for postural stability assessment of a user, said method comprising:

5 collecting spatio-temporal information of joints of a user for one or more actions performed by the user, pertaining to a Single Limb Stance (SLS) duration, body joint vibration, and body sway area, of the user being monitored for postural stability assessment, via one or more hardware processors;

10 determining the SLS duration, the body joint vibration, and the body sway area, of said user as falling under at least one respective category, via the one or more hardware processors, by comparing values of the SLS duration, the body joint vibration, and the body sway area, with a range of

15 corresponding membership functions, wherein the range of the corresponding membership functions is dynamically determined associated with each user, wherein the membership function refers to classifications each of the SLS time duration, the body joint vibration, and the body sway area under different categories defined by ranges of values;

20 dynamically generating a postural stability index score for said user, based on said determined at least one category of the SLS duration, the body joint vibration, and the body sway area, and at least one rule, via the one or more hardware

25 processors; and

 automatically assessing, by the hardware processor, postural stability of said user, based on said postural stability index score.

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2. The method as claimed in claim 1, wherein dynamically determining the range of membership functions comprise of:
- collecting values for parameters having impact on the user's health;
 - comparing the values of the parameters with a learning model to determine the category for selection of the range of the membership functions; and
 - determining the range of membership function of the SLS duration, the body joint vibration, and the body sway area, that matches the collected values of the parameters.
3. A system for postural stability assessment of a user, said system comprising:
- a processor; and
 - a memory module comprising a plurality of instructions, said plurality of instructions configured to cause the processor to:
 - monitor an action being performed by a user and collecting spatio-temporal information of joints of a user pertaining to the action being performed by the user, by an Input/Output (I/O) module of the system;
 - determine a value corresponding to Single Limb Stance (SLS) duration of the user, based on the spatio-temporal information, by a SLS duration measurement module of the system;
 - determine a value corresponding to body joint vibration of the user, based on the spatio-temporal information, by a body joint vibration determination module of the system;
 - determine a value corresponding to body sway area of the user, based on the spatio-temporal information, by

a sway area determination module of the system;
 dynamically determine the SLS duration, the body joint
 vibration, and the body sway area, of said user as
 falling under at least one respective category, by a
 5 stability index generation module of the system by
 comparing values of the SLS duration, the body joint
 vibration, and the body sway area, with a range of
 corresponding membership functions, wherein the
 10 range of the corresponding membership functions is
 dynamically determined associated with each user,
 wherein the membership function refers to
 classifications each of the SLS time duration, the body
 joint vibration, and the body sway area under different
 categories defined by ranges of values;
 15 generate a postural stability index score for said user,
 based on said determined at least one category of the
 SLS duration, the body joint vibration, and the body
 sway area and at least one rule, by a stability index
 generation module of the system; and
 20 automatically assess postural stability of said user,
 based on said postural stability index score, by a
 stability assessment module of the system.

4. The system as claimed in claim 3, wherein the stability index
 25 generation module is configured to dynamically determine the range
 of membership functions corresponding to the SLS duration, the
 body joint vibration, and the body sway area, by:

collecting values of the parameters having impact on user's
 health, using the I/O module;

30 comparing the spatio-temporal information with a learning
 model; and

determining a range membership functions of the SLS duration, the body joint vibration, and the body sway area, that matches the collected values of the parameters.

- 5 5. One or more non-transitory machine readable information storage mediums comprising one or more instructions which when executed by one or more hardware processors causes:

10 collecting spatio-temporal information of joints of a user for one or more actions performed by the user, pertaining to a Single Limb Stance (SLS) duration, body joint vibration, and body sway area, of the user being monitored for postural stability assessment, via one or more hardware processors;

15 determining the SLS duration, the body joint vibration, and the body sway area, of said user as falling under at least one respective category, via the one or more hardware processors by comparing values of the SLS duration, the body joint vibration, and the body sway area, with a range of corresponding membership functions, wherein the range of the corresponding membership functions is dynamically

20 determined associated with each user, wherein the membership function refers to classifications each of the SLS time duration, the body joint vibration, and the body sway area under different categories defined by ranges of values;

25 dynamically generating a postural stability index score for said user, based on said determined at least one category of the SLS duration, the body joint vibration, and the body sway area and at least one rule, via the one or more hardware processors; and

30 automatically assessing postural stability of said user, based on said postural stability index score, via the one or more hardware processors.

6. The one or more non-transitory machine readable information storage mediums of claim 5, wherein the one or more instructions which when executed by the one or more hardware processors cause dynamic determination of the range of membership functions by:
- collecting values of the parameters having impact on user's health;
 - comparing the values of the parameters with a learning model; and
 - determining a range of membership functions of the SLS duration, the body joint vibration, and the body sway area, that matches the collected values of the parameters.