

CLAIMS

What is claimed is:

1. A method for providing real-time assessment of falling risk, the method comprising:
 - providing a user with a survey comprising questions directed to eliciting information regarding assessing falls risk across a plurality of domains;
 - receiving the elicited information comprising answers to the questions that are indicative of a risk of falling of the user;
 - recording, via a depth camera system, depth video data of an activity of the user;
 - determining, based on the depth video data, at least one spatio-temporal gait characteristic associated with the activity performed by the user;
 - conducting a quantitative fall risk analysis based on the at least one spatio-temporal gait characteristic and the elicited information; and
 - displaying at least a portion of the quantitative fall risk analysis to the user.
2. The method as recited in claim 1, wherein the providing the user with the survey includes presenting the questions with an interactive animated conversational graphical user interface.
3. The method as recited in claim 2, further comprising displaying a representation of the activity to be performed by the user via the interactive animated conversational graphical user interface.
4. The method as recited in claim 1, wherein the plurality of domains include history, medication, environmental, physical, and vision.

5. The method as recited in claim 1, wherein the determining the at least one spatio-temporal gait characteristic includes tracking a position and orientation of the user in the depth video data.
6. The method as recited in claim 1, wherein the at least one spatio-temporal gait characteristic includes one or more of a gait velocity, a stride length, a step length, and a step width.
7. The method as recited in claim 1, wherein the at least one spatio-temporal gait characteristic includes one or more of a time in stance, a time in swing, a time in double support, a stance time variability, and a swing time variability.
8. The method as recited in claim 1, wherein the at least one spatio-temporal gait characteristic includes one or more of a test duration, a turning duration, a sit-to-stand duration, a stand-to-sit duration, a number of sit-to-stand repetitions completed within a predetermined period of time, and a number of stand-to-sit repetitions completed within a predetermined period of time.
9. The method as recited in claim 1, further comprising providing, in real-time, consultative recommendations based on the quantitative fall risk analysis.
10. The method as recited in claim 9, wherein providing the consultative recommendations includes:
 - accessing a cloud-based normative data storage having normative data, risk ratios, and recommendations;
 - comparing the quantitative fall risk analysis to the normative data and risk ratios; and
 - based on the comparison, selecting a recommendation of the recommendations accessed from the cloud-based normative data storage.

11. A system for providing real-time assessment of falling risk, the system comprising:

- a kiosk;
- a tablet device communicatively coupled to the kiosk;
- a depth camera system communicatively coupled to the kiosk;
- at least one processor; and
- a memory storing processor-executable instructions, wherein the at least one processor is configured to implement the following operations upon executing the processor-executable instructions:

- providing a user with a survey comprising questions directed to eliciting information regarding assessing falls risk across a plurality of domains;

- receiving the elicited information comprising answers to the questions that are indicative of a risk of falling of the user;

- recording, via a depth camera system, depth video data of an activity of the user;

- determining, based on the depth video data, at least one spatio-temporal gait characteristic associated with the activity performed by the user;

- conducting a quantitative fall risk analysis based on the at least one spatio-temporal gait characteristic and the elicited information; and

- displaying at least a portion of the quantitative fall risk analysis to the user.

12. The system as recited in claim 11, further comprising an interactive animated conversational graphical user interface displayed by the tablet device.

13. The system as recited in claim 12, wherein the at least one processor is further configured to implement the operation of displaying a representation of the activity to be performed by the user via the interactive animated conversational graphical user interface.
14. The system as recited in claim 11, wherein the determining the at least one spatio-temporal gait characteristic includes tracking a position and orientation of the user in the depth video data.
15. The system as recited in claim 11, wherein the at least one spatio-temporal gait characteristic includes one or more of a gait velocity, a stride length, a step length, and a step width.
16. The system as recited in claim 11, wherein the at least one spatio-temporal gait characteristic includes one or more of a time in stance, a time in swing, a time in double support, a stance time variability, and a swing time variability.
17. The system as recited in claim 11, wherein the at least one spatio-temporal gait characteristic includes one or more of a test duration, a turning duration, a sit-to-stand duration, a stand-to-sit duration, a number of sit-to-stand repetitions completed within a predetermined period of time, and a number of stand-to-sit repetitions completed within a predetermined period of time.
18. The system as recited in claim 11, wherein the at least one processor is further configured to implement the operation of providing, in real-time, consultative recommendations based on the quantitative fall risk analysis.

19. The system as recited in claim 18, wherein providing the consultative recommendations includes:

- receiving a predetermined threshold associated with a domain from a cloud-based normative data storage;
- comparing a domain score of the quantitative fall risk analysis to the predetermined threshold;
- determining, based on the comparison, that the domain score exceeds the predetermined threshold; and
- displaying, if the domain score exceeds the predetermined threshold, a recommendation to the user.

20. A non-transitory computer readable medium having embodied thereon instructions being executable by at least one processor to perform a method for providing real-time assessment of falling risk, the method comprising:

- providing a user with a survey comprising questions directed to eliciting information regarding assessing falls risk across a plurality of domains;
- receiving the elicited information comprising answers to the questions that are indicative of a risk of falling of the user;
- recording, via a depth camera system, depth video data of an activity of the user;
- determining, based on the depth video data, at least one spatio-temporal gait characteristic associated with the activity performed by the user;
- conducting a quantitative fall risk analysis based on the at least one spatio-temporal gait characteristic and the elicited information; and
- displaying at least a portion of the quantitative fall risk analysis to the user.