CLAIMS

What is claimed is:

1. A method comprising:

providing a device to a user, wherein the device includes a processor and a time-of-flight radar, wherein the processor is coupled to the time-of-flight radar, wherein the time-of-flight radar is configured to operate in a K-band,

wherein the processor is programmed to allow the user to geofence or define an area of interest; and instructing the user to:

position the device within a defined area having an object positioned therein, and

activate the time-of-flight radar to operate in the K-band within the defined area such that the time-of-flight radar operating in the K-band within the defined area tracks the object positioned in the defined area, generates a set of data based on tracking the object positioned in the defined area, and sends the set of data to the processor such that the processor determines whether the object is experiencing an event within the defined area based on the set of data, ignores the set of data for outside the area of interest, and takes an action responsive to the event determined to be occurring within the defined area, wherein

(i) the processor is programmed to allow the user to geofence or define the area of interest based on the defined area having an interior perimeter and the user being instructed to walk around the interior perimeter and notify the time-of-flight radar as to when the time-of-flight radar should take a measurement of a position of the user, or

(ii) the processor is programmed to allow the user to geofence or define the area of interest based on the user being instructed to provide or draw a map of the defined area on a computing device and place the time-of-flight radar in the map for the processor of the device to access.

2. The method of claim 1, wherein the processor is programmed to allow the user to geofence or define the area of interest based on the defined area having an interior perimeter and the user being instructed to walk around the interior perimeter and notify

the time-of-flight radar as to when the time-of-flight radar should take a measurement of a position of the user.

3. The method of claim 2, wherein the user being instructed to walk around the interior perimeter and notify the time-of-flight radar through a computing unit having a button where the computing unit communicates with the device based on the button being pressed.

4. The method of claim 1, wherein the processor is programmed to allow the user to geofence or define the area of interest based on the defined area having a room geometry or an identification and the user being instructed to record the room geometry or the identification via a mobile application running on a mobile phone or a tablet computer communicating with the device.

5. The method of claim 1, wherein the processor is programmed to allow the user to geofence or define the area of interest based on the processor being put into a geo-fencing mode where the processor assumes the user is only moving in the area of interest that is desired to be recorded and the user being instructed to move freely through the defined area to be tracked by the time-of-flight radar for the processor to record an extreme edge or corner of this movement such that the user notifies the device that the user is done geofencing or defining the area of interest.

6. The method of claim 1, wherein the processor is programmed to allow the user to geofence or define the area of interest based on the user being instructed to walk around the defined area carrying a mobile device running a mobile app instructing the user how the user should walk around the defined area based on the mobile device communicating with the device.

7. The method of claim 1, wherein the processor is programmed to allow the user to geofence or define the area of interest based on the user being instructed to walk inside or outside the area of interest.

8. The method of claim 1, wherein the processor is programmed to allow the user to geofence or define the area of interest based on the user being instructed to carry a reflective object while walking around the defined area.

9. The method of claim 1, wherein the processor is programmed to allow the user to geofence or define the area of interest based on the defined area having a floor and a ceiling and the user being instructed to input a height value for how high the time-of-flight radar is positioned above the floor and below the ceiling.

10. The method of claim 1, wherein the processor is programmed to allow the user to geofence or define the area of interest based on the defined area having a floor and a ceiling and the processor assuming a default height value for how high the time-of-flight radar is positioned above the floor and below the ceiling.

11. The method of claim 1, wherein the processor is programmed to allow the user to geofence or define the area of interest based on the user being instructed to provide or draw a map of the defined area on a computing device and place the time-of-flight radar in the map for the processor of the device to access.

12. The method of claim 1, wherein the processor is programmed to allow the user to geofence or define the area of interest based on the user moving within the defined area before the processor takes the action responsive to the event determined to be occurring within the defined area.

13. The method of claim 1, wherein the processor is programmed to allow the user to geofence or define the area of interest based on the user moving outside the defined area before the processor takes the action responsive to the event determined to be occurring within the defined area.

14. The method of claim 1, wherein the processor is programmed to allow the user to geofence or define the area of interest based on the user hosting a reflector trackable by the time-of-flight radar before the processor takes the action responsive to the event determined to be occurring within the defined area.

15. The method of claim 1, wherein the processor is programmed to allow the user to geofence or define the area of interest based on the processor accessing a map of the defined area before the processor takes the action responsive to the event determined to be occurring within the defined area.

16. The method of claim 1, wherein the processor is programmed to allow the user to geofence or define the area of interest based on the user may be instructed to create a map of the defined area before the processor takes the action responsive to the event determined to be occurring within the defined area.

17. The method of claim 1, wherein the processor ignores the set of data for outside the area of interest on a per beam position basis where the time-of-flight radar scans its field of view in a lawnmower pattern.

18. The method of claim 1,
(a) wherein the processor forms a three-dimensional skeletal model simulating the object based on the set of data, determines whether the object is experiencing the event within the defined area based on the three-dimensional skeletal model satisfying or not satisfying a threshold, and takes the action responsive to the event determined to be occurring within the defined area based on the three-dimensional skeletal model satisfying or not satisfying the threshold, or (b) wherein the processor forms a three-dimensional area model simulating the defined area based on the set of data and a three-dimensional skeletal model simulating the object within the three-dimensional area model based on the set of data, determines whether the object is experiencing the event within the defined area based on the three-dimensional skeletal model within the three-dimensional area model satisfying or not satisfying a threshold, and takes the action

responsive to the event determined to be occurring within the defined area based on the three-dimensional skeletal model within the three-dimensional area model satisfying or not satisfying the threshold.

19. The method of claim 18, wherein the processor determines whether the object is experiencing the event within the defined area based on the three-dimensional skeletal model satisfying or not satisfying the threshold based on a set of virtual movements of the three-dimensional skeletal model, identifying a set of atomic movements of the three-dimensional skeletal model corresponding to the set of virtual movements, and correlating the set of atomic movements to the event.

20. The method of claim 1, wherein the processor is programmed to reset the area of interest based on the time-of-flight radar being moved after being positioned within the defined area having the object positioned therein.

21. The method of claim 1, wherein the defined area includes a stud frame having a drywall/siding configuration or a drywall/drywall configuration.

22. The method of claim 1, wherein the processor is programmed to adjust the area of interest due to a change in environment.

23. The method of claim 1, wherein the user is the object.

24. The method of claim 1, wherein the user is not the object.

25. The method of claim 24, wherein the object is a pet.

26. The method of claim 1, wherein the object is a first object, wherein the processor is programmed to track a second object positioned within the defined area based on the set of data and distinguish the first object positioned in the defined area from the second object positioned within the defined area based on the set of data before determining

whether the first object is experiencing the event involving the first object within the defined area based on the set of data.

27. The method of claim 26, wherein the second object is a pet.

28. A system comprising:

a device including a processor and a time-of-flight radar, wherein the processor is coupled to the time-of-flight radar, wherein the time-of-flight radar is configured to operate in a K-band,

wherein the processor is programmed to allow a user to geofence or define an area of interest,

wherein the device is configured to be positioned within a defined area having an object positioned therein such that the time-of-flight radar operating in the K-band within the defined area tracks the object positioned in the defined area, generates a set of data based on tracking the object positioned in the defined area, and sends the set of data to the processor such that the processor determines whether the object is experiencing an event within the defined area based on the set of data, ignores the set of data for outside the area of interest, and takes an action responsive to the event determined to be occurring within the defined area,

wherein the processor is programmed to reset the area of interest based on the time-of-flight radar being moved after being positioned within the defined area having the object positioned therein.

29. A method comprising:

geofencing or defining, by a processor, an area of interest within a defined area; receiving, by the processor, a set of data from a radar operating in a K-band within the defined area having an object positioned therein,

wherein the radar generating the set of data based on the radar operating in the K-band within the defined area and tracking the object in the defined area;

ignoring, by the processor, the set of data for outside the area of interest; determining, by the processor, whether an action should be taken based on the set of data; and taking,

by the processor, the action based on the set of data, wherein the object is a first object, wherein the processor is programmed to track a second object positioned within the defined area based on the set of data and distinguish the first object positioned in the defined area from the second object positioned within the defined area based on the set of data before determining whether the first object is experiencing the event involving the first object within the defined area based on the set of data.

30. A system comprising:

a device including a processor and a radar, wherein the processor is coupled to the radar, wherein the radar is configured to operate in a K-band,

wherein the processor is programmed to allow a user to geofence or define an area of interest,

wherein the device is configured to be positioned within a defined area having an object positioned therein such that the radar operating in the K-band within the defined area tracks the object in the defined area, generates a set of data based on tracking the object in the defined area, and sends the set of data to the processor such that the processor determines whether an action should be taken based on the set of data, ignores the set of data for outside the area of interest, and takes the action based on the set of data wherein the user is the object.