

What is claimed is:

1. A method of detecting multiple people in a room, comprising:
 - detecting a point cloud corresponding to at least one user moving in the room;
 - forming a bounding box corresponding to coordinates of points of the point cloud; and
 - 5 determining if the point cloud corresponds to multiple people based on at least one of:
a size of the point cloud, a presence of separate clusters of points in the point cloud, or
detecting one or more people entering or leaving the room.
2. A method, according to claim 1, wherein detecting a point cloud includes using a tracking device to capture movements of the user.
- 10 3. A method, according to claim 2, wherein the tracking device uses radar.
4. A method, according to claim 1, wherein the size of the point cloud is compared with a size of a point cloud corresponding to a single user of the room.
5. A method, according to claim 4, wherein a presence of separate clusters of points in the point cloud is detected following determining that the size of the point cloud is larger than the
15 size of the point cloud corresponding to a single user of the room.
6. A method, according to claim 5, wherein separate clusters of points are determined using projection-based clustering or Delaunay triangulation.
7. A method, according to claim 6, wherein the projection-based clustering includes projecting horizontal coordinates of points of the point cloud upon a series of horizontal directions and
20 choosing one or more horizontal directions where the projections of two or more subsets of points are distinct and possess a maximum average distance between the projections of the adjacent subsets.

8. A method, according to claim 6, wherein the Delaunay triangulation is clustered based on cutting the graph of the Delaunay triangulation built for the top view of the point cloud into connected components according to lengths of the sides of triangles.
9. A method, according to claim 5, wherein a Kalman filter is used to track movement of people
5 in the room.
10. A method, according to claim 9, wherein the Kalman filter uses bounding rectangles of horizontal coordinates of separate clusters of points in the point cloud as representations of dynamic objects.
11. A method, according to claim 1, wherein detecting one or more people entering or leaving
10 the room includes previously detecting entrances of the room.
12. A method, according to claim 11, wherein previously detecting entrances of the room includes tracking movement of people in the room and determining a location where movement results in more or less people in the room.
13. A method, according to claim 12, wherein an entrance is detected when a person in the
15 room is detected to be walking toward a boundary of the room and, subsequently, the person is no longer detected as being in the room.
14. A method, according to claim 1, further comprising:
obtaining vital signs of a user in the room in response to there being only being a single person in the room.
- 20 15. A method, according to claim 14, wherein vital signs of the user are obtained at an end of a decision-making period in response to a single person being in the room during the decision-making period.
16. A method, according to claim 15, wherein the decision-making period is one minute.

17. A method, according to claim 15, wherein the decision-making period is subdivided into a plurality of discovery periods in which multiple people or a single person is detected in the room.

18. A method, according to claim 17, wherein, for each of the discovery periods, a multi-person
5 presence status is set to one of: yes, no, or uncertain according to the point cloud at different times during each of the discovery periods.

19. A method, according to claim 18, wherein the multi-person presence status of the decision-making period is determined by aggregating the multi-person presence statuses of each of the discovery periods.

10 20. A method, according to claim 19, wherein the aggregation uses probabilistic reasoning.

21. A non-transitory computer readable medium containing software that detects multiple people in a room, the software comprising:

executable code that detects a point cloud corresponding to at least one user moving in the room;

15 executable code that forms a bounding box corresponding to coordinates of points of the point cloud; and

executable code that determines if the point cloud corresponds to multiple people based on at least one of: a size of the point cloud, a presence of separate clusters of points in the point cloud, or detecting one or more people entering or leaving the room.

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