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(54) Title: SPACE TIME REGION BASED COMMUNICATIONS

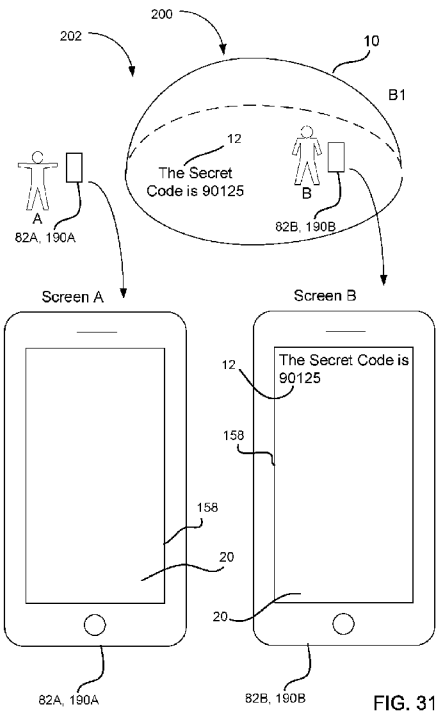

FIG. 31

(57) Abstract: There is disclosed an apparatus including a node with a processor, a communications interface, and a computer readable memory that has other and a space time modules that enable space time region based communication if space time region based criteria are met. There is disclosed a method with steps of: providing an interface; determining if a space time region based criteria is met; and enabling communication over the interface if the space time region based criteria is met. There is disclosed a user interface method having the steps of: providing a view that controls objects representing a spatio temporal information related to a space time based communication rendered on the interface; and displaying information on the user interface in relation to the space time region based communication if a space time region based criteria are met.

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AMENDED CLAIMS
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1. An apparatus suitable for space time region based communications, the apparatus comprising:

a processor;

a communications interface; and

a space time module including spatio temporal information that are read and written by the processor, the spatio temporal information including at least one space time record including a location portion and a time portion defining a spatio temporal coordinate, the space time record further including at least one of a device UUID, an Agent type and an Other Information, the spatio temporal information further including a space time region defining a volume of space and time dimensions considered together;

wherein the processor is operable to enable communication via the communications interface using at least one of the device UUID, the Agent type, and Other Information if space time region based criteria is met, the space time region based criteria including that the location portion and the time portion of the spatio temporal coordinate is deemed to be inside the volume of space and time dimensions considered together of the space time region, and that the time portion of the spatio temporal information coordinate includes at least a time in the past.

2. The apparatus of claim 1, wherein the space time module provides a client application.

3. The apparatus of claim 1, wherein the space time module provides a server application.

4. The apparatus of claim 1, wherein the processor is operable in at least one of a mobile device, smartphone, tablet, computer, device, and bubble board.

5. The apparatus of claim 1, wherein the processor is operable in at least one of a bubble server, notification server, space time record server, geo channel server, and geo channel directory server.

6. The apparatus of claim 1, wherein the spatio temporal information includes at least one of a creation date, a start date, an end date, a timestamp, a longitude, a latitude, an altitude, a diameter, and an other information.

7. The apparatus of claim 6, wherein the spatio temporal information includes at least one

channel data to regroup one or more bubble data.

8. The apparatus of claim 1, wherein the spatio temporal information includes a bubble data and wherein the spatio temporal information includes a bubble spatio temporal information.

9. The apparatus of claim 8, wherein the bubble data has a space time region attribute that represents an arbitrary shape in space time.

10. The apparatus of claim 9, wherein a one or more bubble exist at points in time and space that need not be contiguous and that need not be connected to form a generalized space time region.

11.The apparatus of claim 8, wherein the bubble data includes bubble other information, the bubble other information including at least one of content type, content, actions allowed, bubble key, shape Id, category, owner Id, geo channels, channel, opacity, elasticity, bubble ID and other information.

12. The apparatus of claim 8, wherein the bubble data can have different values at different points in time.

13. The apparatus of claim 8, wherein the spatio temporal information includes at least one bubble trail data that includes a sequence of one or more bubble data that are linked together in an orderly fashion whereby a given bubble in the trail will be revealed to a user if the user visited the immediate predecessor in the bubble trail data.

14. The apparatus of claim 1, wherein the spatio temporal information includes a geo channel data that includes a geo channel spatio temporal information, and the spatio temporal information includes the geo channel spatio temporal information.

15. The apparatus of claim 14, wherein the geo channel data includes geo channel server information.

16. The apparatus of claim 15, wherein the geo channel server information includes at least one of a notificationServerUrl, a bubblesServerUrl, and a spaceTimeRecordServerUrl for respective at least one of a notifications server, a bubbles server and a space time record server respectively in order to help load balance work done by one or more bubbles servers, notifications servers and space time record servers.

17. (Deleted)

18. (Deleted)

19. (Deleted)

20. The apparatus of claim 1, wherein the space time module includes at least one of a bubble creation interface, a bubble contents display interface, a bubble/paths controller.

21. The apparatus of claim 1, further including at least one of a location controller, and a communication module.

22. A method of space time region based communication over an interface, the method comprising the steps of:

providing an interface;

providing spatio temporal information including at least one space time record including a location portion and a time portion defining a spatio temporal coordinate, the space time record further including at least one of a device UUID, an Agent type and an Other Information, the spatio temporal information further including a space time region defining a volume of space and time dimensions considered together;

determining if space time region based criteria is met, the space time based criteria including determining if a location portion and a time portion of a spatio temporal coordinate is deemed to be inside a volume of space and time dimensions considered together of a space time region, wherein the time portion of the spatio temporal information coordinate includes at least a time in the past. and

enabling communication using at least one of the device UUID, the Agent type, and Other Information over the interface if the space time region based criteria is met.

23. The method of claim 22, wherein the step of providing an interface includes at least one of: providing a communications interface, providing a user interface, and providing an application programming interface.24. (Deleted)

25. (Deleted)

26. (Deleted)

27. The method of claim 22, further comprising the step of relating a spatio temporal information to at least one of a past time, a present time, and a future time, a lifespan of a bubble, a geo

channel selection criteria, a bubble selection criteria, a device selection criteria, a node selection criteria, a user selection criteria, a surface element, a Delaunay triangulation, and a Voronoi diagram.

28. The method of claim 22, further comprising the step of comparing a first information to a second information, and determining that the first information is at least one of equal and different than the second information, wherein the first and second information include at least one of comparison between two quantities, a time, a location, a latitude, a longitude, an altitude, a start date, an end date, a creation date, a lifespan, a diameter, an opacity, an elasticity, a permission, a shape, a category, a content type, a geo channel, a channel, an action, and a bubble key.

29.The method of claim 22, further comprising at least one of the steps of creating, retrieving, updating, and deleting a bubble data structure.

30.The method of claim 29, further comprising the step of sending the space time region based communication via the interface.

31.The method of claim 29, further comprising the step of communicating the space time region based communication using an implementation of at least one of an https protocol, an http protocol, websockets, and sockjs.

32. The method of claim 29, further comprising the step of communicating the space time region based communication by including at least one message of: subscribe, unsubscribe, create new bubble, bubble created, new bubble, new bubble notification, bubble created in the past, space time notification, space time record, bubble contents, retrieve new bubbles, new bubbles, register to notifications, send space time record, create bubble, new bubble notification, answer, and new answer notification.

33. The method of claim 22, further comprising the step of providing a trigger step to cause the determining step to occur.

34. The method of claim 33, wherein the trigger step is one of a communication trigger, a user interface trigger, and an application programming interface trigger.

35. In a user interface, a method for rendering objects and handling behavior of said objects in relation to space time region based communications comprising the steps of:

providing spatio temporal information including at least one space time record including a location portion and a time portion defining a spatio temporal coordinate, the

space time record further including at least one of a device UUID, an Agent type and an Other Information, the spatio temporal information further including a space time region defining a volume of space and time dimensions considered together;

providing a view that controls at least one of an appearance and a behavior of objects rendered on the interface wherein at least one of said objects represents a spatio temporal information related to a space time based communication, spatio temporal information including at least one space time record including a location portion and a time portion defining a spatio temporal coordinate, the space time record further including at least one of a device UUID, an Agent type and an Other Information, the spatio temporal information further including a space time region defining a volume of space and time dimensions considered together; and

displaying information on the user interface in relation to the space time region based communication if a space time region based criteria are met, the space time region based criteria including that a location portion and a time portion of a spatio temporal coordinate is deemed to be inside the volume of space and time dimensions considered together of a space time region, and that the time portion of the spatio temporal information coordinate includes at least a time in the past.

36. The method of claim 35, wherein the at least one of said objects is one of a map bubble view, a map foam view, and a bubble feed view, other interface element, a mode interface element, a location interface element, a bubble interface element, a map interface element, an overlay, a bubble content creation element, a bubble action interface element, a location interface element, a geographic feature, a bubble content viewing icon, a bubble content, and a spatio temporal element.

37. The method of claim 35, further comprising the step of receiving user input in relation to the space time region based communication.

38. The method of claim 35, wherein the user interface has represents a bubble data structure as one of a circle, a disc, and a sphere.

39. The method of claim 35, further comprising the step of displaying a content of a bubble data structure that includes at least one of a text, a tag/keyword, a bubble key, an image, an audio, an htm, a video, a permission, an action, a coupon, a comment, and a password.

40. The method of claim 35, further comprising the step of categorizing a bubble data structure using a category tag enabling the user interface to be adapted to be one of application specific

and application agnostic.

41. The method of claim 35, further comprising the step of reflecting the opacity of a bubble data structure in the user interface whereby if the bubble data structure has an opaque opacity, the user interface will reveal a content of the bubble data structure in the user that is operated at a spatio temporal coordinate that is deemed to be inside a bubble spatio temporal information of the bubble data structure.

42. The method of claim 35, further comprising the step of reflecting the opacity of a bubble data structure in the user interface whereby if the bubble data structure has a transparent opacity, the user interface enables the bubble data structure to be browsed by allowing the user to choose at least one location on a map and at least one time frame.

43. The method of claim 35, further comprising the step of reflecting the elasticity of a bubble data structure in the user interface whereby if the bubble data structure has an elastic elasticity, the user interface enables the bubble data structure to reveal a content to a user that is deemed to have operated the user interface at least once at a spatio temporal coordinate that is deemed to be inside a bubble spatio temporal information of the bubble data structure.

44. The method of claim 35, further comprising the step of representing a bubble data structure in the user interface as information that occupies a

bubble spatio temporal information of the bubble data structure.

45. The method of claim 35, further comprising the step of representing a bubble spatio temporal information of a bubble data structure in the user interface as a lifespan of the bubble data structure from a start date to an end date at a specified diameter, and at a specified at least one of longitude, latitude, and altitude.

46. The method of claim 35, further comprising the step of representing a bubble data structure in the user interface such that it can be one of hidden and made available to a user when the user meets a specified condition.

47. The method of claim 46, further comprising the step of determining that the user possesses a bubble key as a part of the specified condition.

48. The method of claim 46, further comprising the step of determining that one of the bubble key condition is met and a pre defined criteria is met to allow the user interface to reveal a representation of a bubble data structure that is part of a bubble trail data structure.

STATEMENT UNDER ARTICLE 19 (1)

The number of originally filed claims is 48, accordingly with the amendments made deleting claims 17-19 and 24-26, this number is reduced to 42.

Independent claims 1, 22 and 35 were amended to further specify UUID and Agent Type and Other Information used in communications as well as to further specify a specific space time region based criteria. This enables the unexpected result that recipients of a communication are allowed to interact when their previous location at a given past time is inside a space time region who at least partially covers a past volume of space time. Applicant verily believes this unexpected and advantageous result of enabling a person to communicate instantly with other people who were there in the past is neither taught nor suggested by references D1 or D2 when considered alone or in combination.