

Claims

What is claimed is:

1. A system for determining a location of a computing device, the system comprising:

a processor, the processor configurable to:

communicate, via a communication channel, with the computing device;

assess, via the communication channel, a current state of the computing

device, the current state being one of the following states:

a charging state, the charging state being a state in which an energy source of the computing device is connected to and/or being charged by an external energy source; or

a non-charging state, the non-charging state being a state in which the energy source of the computing device is not connected to and/or not being charged by the external energy source;

determine whether the computing device is receiving wireless signals, each of the received wireless signals being associated with a wireless local area network (WLAN) or another form of short range wireless signal;

responsive to a determination that the computing device is receiving the wireless signals from two or more transmitting devices:

determine information pertaining to the received wireless signals including an identification of at least a nearest transmitting device, the nearest transmitting device being the transmitting device associated with the received wireless signal having a strongest signal level from among the received wireless signals; and

derive a first location status of the computing device based on at least the current state of the computing device and the identification of the nearest transmitting device; and

responsive to a determination that the computing device is receiving the wireless signals from a single transmitting device:

determine information pertaining to the wireless signals received from the single transmitting device including an identification of the single transmitting device; and

derive a second location status of the computing device based on at least the current state of the computing device and the identification of the single transmitting device.

2. The system of claim 1,

wherein the first location status is one of the following statuses:

an accurate location status, the accurate location status being a status in which a location of the computing device can be positively identified; or

an approximate location status, the approximate location status being a status in which the location of the computing device can be estimated;

wherein the processor derives the first location status to be the accurate location status when:

the current state of the computing device is the charging state; and

the identification of the nearest transmitting device matches a predetermined transmitting device identification that has been assigned to the computing device; and

wherein processor derives the first location status to be the approximate location status when:

the current state of the computing device is the non-charging state and the identification of the nearest transmitting device matches the predetermined transmitting device identification that has been assigned to the computing device, in which case the estimated location is an area within a range of the WLAN or other short range wireless signal

of the predetermined transmitting device assigned to the computing device; or

the current state of the computing device is the non-charging state and the identification of the nearest transmitting device does not match the predetermined transmitting device identification that has been assigned to the computing device, in which case the estimated location is outside of the range of the WLAN or other short range wireless signal of the predetermined transmitting device assigned to the computing device.

3. The system of claim 1,

wherein the charging state is one of the following states:

an alternating current (AC) charging state, the AC charging state being a state in which the energy source of the computing device is connected to and/or being charged by an AC external energy source; or

a non-alternating current (non-AC) charging state, the non-AC charging state being a state in which the energy source of the computing device is connected to and/or being charged by a non-AC external energy source;

wherein when the processor assesses the current state to be the charging state, the processor is further configurable to determine whether the charging state is the AC charging state or the non-AC charging state;

wherein the first location status is one of the following statuses:

an accurate location status, the accurate location status being a status in which a location of the computing device can be positively identified; or

an approximate location status, the approximate location status being a status in which the location of the computing device can be estimated;

wherein the processor derives the first location status to be the accurate location status when:

the current state of the computing device is the AC charging state; and

the identification of the nearest transmitting device matches a predetermined transmitting device identification that has been assigned to the computing device;

wherein processor derives the first location status to be the approximate location status when:

the current state of the computing device is the AC charging state and the identification of the nearest transmitting device does not match the predetermined transmitting device identification that has been assigned to the computing device, in which case the estimated location is outside of the range of the WLAN or other short range wireless signal of the predetermined transmitting device assigned to the computing device;

the current state of the computing device is the non-AC charging state and the identification of the nearest transmitting device matches the predetermined transmitting device identification that has been assigned to the computing device, in which case the estimated location is an area within a range of the WLAN or other short range wireless signal of the predetermined transmitting device assigned to the computing device;

the current state of the computing device is the non-charging state and the identification of the nearest transmitting device matches the predetermined transmitting device identification that has been assigned to the computing device, in which case the estimated location is the area within the range of the WLAN or other short range wireless signal of the predetermined transmitting device assigned to the computing device; or

the identification of the nearest transmitting device does not match the predetermined transmitting device identification that has been assigned to the computing device, in which case the estimated location is outside of the range of the WLAN or other short range wireless signal of the predetermined transmitting device assigned to the computing device.

4. A method of determining a location of a computing device, the method comprising:

assessing a current state of the computing device, the current state being one of the following states:

a charging state, the charging state being a state in which an energy source of the computing device is connected to and/or being charged by an external energy source; or

a non-charging state, the non-charging state being a state in which the energy source of the computing device is not connected to and/or not being charged by the external energy source;

determining whether the computing device is receiving wireless signals, each of the received wireless signals being associated with a wireless local area network (WLAN) or another form of short range wireless signal;

responsive to a determination that the computing device is receiving the wireless signals from two or more transmitting devices:

determining a signal level of the wireless signals received from each of the two or more transmitting devices;

determining information pertaining to the wireless signals received from each of the two or more transmitting devices including an identification of a nearest transmitting device, the nearest transmitting device being the transmitting device associated with the received wireless signal having the strongest signal level from among the determined signal levels; and

deriving a first location status of the computing device based on at least the current state of the computing device and the identification of the nearest transmitting device; and

responsive to a determination that the computing device is receiving the wireless signals from a single transmitting device:

determining information pertaining to the wireless signals received from the

single transmitting device including an identification of the single transmitting device; and

deriving a second location status of the computing device based on at least the current state of the computing device and the identification of the single transmitting device.

5. The method of claim 4, wherein one or more of the following apply:

the current state of the computing device is assessed by the computing device; and/or

the signal level of each of the received wireless signals is measured by the computing device.

6. The method of claim 4, wherein one or more of the following apply:

each of the two or more transmitting devices comprises a wireless access point

(WAP); and/or

the single transmitting device comprises a WAP.

7. The method of claim 4, wherein one or more of the following apply:

the identification of each of the two or more transmitting devices comprises a basic service set identification (BSSID); and/or

the identification of the single transmitting device comprises a BSSID.

8. The method of claim 4, further comprising determining an identification of a second nearest transmitting device when the computing device is determined to be receiving the wireless signals from the two or more transmitting devices, the second nearest transmitting device being the transmitting device associated with the received wireless signal having the second strongest signal level from among the determined signal levels;

wherein the deriving of the first location status is further based on the identification of the second nearest transmitting device.

9. The method of claim 4, wherein the deriving of the first location status is further based on one or more of the determined signal levels.

10. The method of claim 4, further comprising establishing a communication channel between the computing device and a processor.

11. The method of claim 10, wherein:

the deriving of the first location status is performed by the computing device;

the derived first location status is transmitted from the computing device to the processor via the communication channel;

the deriving of the second location status is performed by the computing device; and

the derived second location status is transmitted from the computing device to the processor via the communication channel.

12. The method of claim 10, wherein one or more of the following apply:

the current state of the computing device is transmitted from the computing device to the processor via the communication channel;

one or more of the determined signal levels are transmitted from the computing device to the processor via the communication channel;

the identification of the nearest transmitting device is transmitted from the computing device to the processor via the communication channel; and/or

the identification of the single transmitting device is transmitted from the computing device to the processor via the communication channel.

13. The method of claim 12, wherein one or more of the following apply:

the deriving of the first location status is performed by the processor; and/or

the deriving of the second location status is performed by the processor.

14. The method of claim 4,

wherein the first location status is one of the following statuses:

an accurate location status, the accurate location status being a status in which a location of the computing device can be positively identified; or

an approximate location status, the approximate location status being a status in which the location of the computing device can be estimated;

wherein the first location status is the accurate location status when:

the current state of the computing device is the charging state; and

the identification of the nearest transmitting device matches a predetermined transmitting device identification that has been assigned to the computing device; and

wherein the first location status is the approximate location status when:

the current state of the computing device is the non-charging state and the identification of the nearest transmitting device matches the predetermined transmitting device identification that has been assigned to the computing device, in which case the estimated location is an area within a range of the WLAN or other short range wireless signal of the predetermined transmitting device assigned to the computing device; or

the current state of the computing device is the non-charging state and the identification of the nearest transmitting device does not match the predetermined transmitting device identification that has been assigned to the computing device, in which case the estimated location is outside of the range of the WLAN or other short range wireless signal of the predetermined transmitting device assigned to the computing device.

15. The method of claim 4,

wherein the charging state is one of the following states:

an alternating current (AC) charging state, the AC charging state being a state in which the energy source of the computing device is connected to and/or being charged by an AC external energy source; or

a non-alternating current (non-AC) charging state, the non-AC charging state being a state in which the energy source of the computing device is connected to and/or being charged by a non-AC external energy source;

wherein when the current state is assessed to be the charging state, the method further comprises assessing whether the charging state is the AC charging state or the non-AC charging state;

wherein the first location status is one of the following statuses:

an accurate location status, the accurate location status being a status in which a location of the computing device can be positively identified; or

an approximate location status, the approximate location status being a status in which the location of the computing device can be estimated;

wherein the first location status is the accurate location status when:

the current state of the computing device is the AC charging state; and

the identification of the nearest transmitting device matches a predetermined transmitting device identification that has been assigned to the computing device;

wherein the first location status is the approximate location status when:

the current state of the computing device is the AC charging state and the identification of the nearest transmitting device does not match the predetermined transmitting device identification that has been assigned to the computing device, in which case the estimated location is outside of the range of the WLAN or other short range wireless signal of the predetermined transmitting device assigned to the computing device;

the current state of the computing device is the non-AC charging state and the identification of the nearest transmitting device matches the predetermined transmitting device identification that has been assigned to the computing device, in which case the estimated location is an area within a range of the WLAN or other short range wireless signal of the predetermined transmitting device assigned to the computing device;

the current state of the computing device is the non-charging state and the identification of the nearest transmitting device matches the predetermined transmitting

device identification that has been assigned to the computing device, in which case the estimated location is the area within the range of the WLAN or other short range wireless signal of the predetermined transmitting device assigned to the computing device; or

the identification of the nearest transmitting device does not match the predetermined transmitting device identification that has been assigned to the computing device, in which case the estimated location is outside of the range of the WLAN or other short range wireless signal of the predetermined transmitting device assigned to the computing device.

16. A method of remotely determining a location of a computing device, the method comprising:

establishing a communication channel between the computing device and a processor;

receiving, at the processor via the communication channel, a current state of the computing device, the current state being one of the following states:

a charging state, the charging state being a state in which an energy source of the computing device is connected to and/or being charged by an external energy source; or

a non-charging state, the non-charging state being a state in which the energy source of the computing device is not connected to and/or not being charged by the external energy source;

receiving, at the processor via the communication channel, information pertaining to a wireless signal of a wireless local area network (WLAN) or other short range wireless signal received by the computing device, the information including an identification of a transmitting device that transmitted the received wireless signal; and

deriving, by the processor, a location status of the computing device based on at least the current state of the computing device and the identification of the transmitting device.

17. The method of claim 16, wherein one or more of the following apply:

the transmitting device comprises a wireless access point (WAP); and/or
the identification of the transmitting device comprises a basic service set
identification (BSSID).

18. The method of claim 16, further comprising determining an identification of a second
transmitting device, the second transmitting device different from the transmitting device;

wherein the deriving of the location status is further based on the identification of the
second transmitting device.

19. The method of claim 16,

wherein the location status is one of the following statuses:

an accurate location status, the accurate location status being a status in which
a location of the computing device can be positively identified; or

an approximate location status, the approximate location status being a status
in which the location of the computing device can be estimated;

wherein the location status is the accurate location status when:

the current state of the computing device is the charging state; and

the identification of the transmitting device matches a predetermined
transmitting device identification that has been assigned to the computing device; and

wherein the location status is the approximate location status when:

the current state of the computing device is the non-charging state and the
identification of the transmitting device matches the predetermined transmitting device
identification that has been assigned to the computing device, in which case the estimated
location is an area within a range of the WLAN or other short range wireless signal of the
predetermined transmitting device assigned to the computing device; or

the current state of the computing device is the non-charging state and the
identification of the transmitting device does not match the predetermined transmitting device

identification that has been assigned to the computing device, in which case the estimated location is outside of the range of the WLAN or other short range wireless signal of the predetermined transmitting device assigned to the computing device.

20. The method of claim 16,

wherein the charging state is one of the following states:

an alternating current (AC) charging state, the AC charging state being a state in which the energy source of the computing device is connected to and/or being charged by an AC external energy source; or

a non-alternating current (non-AC) charging state, the non-AC charging state being a state in which the energy source of the computing device is connected to and/or being charged by a non-AC external energy source;

wherein when the current state is assessed to be the charging state, the method further comprises assessing whether the charging state is the AC charging state or the non-AC charging state;

wherein the location status is one of the following statuses:

an accurate location status, the accurate location status being a status in which a location of the computing device can be positively identified; or

an approximate location status, the approximate location status being a status in which the location of the computing device can be estimated;

wherein the location status is the accurate location status when:

the current state of the computing device is the AC charging state; and

the identification of the transmitting device matches a predetermined transmitting device identification that has been assigned to the computing device;

wherein the location status is the approximate location status when:

the current state of the computing device is the AC charging state and the

identification of the transmitting device does not match the predetermined transmitting device identification that has been assigned to the computing device, in which case the estimated location is outside of the range of the WLAN or other short range wireless signal of the predetermined transmitting device assigned to the computing device;

the current state of the computing device is the non-AC charging state and the identification of the transmitting device matches the predetermined transmitting device identification that has been assigned to the computing device, in which case the estimated location is an area within a range of the WLAN or other short range wireless signal of the predetermined transmitting device assigned to the computing device;

the current state of the computing device is the non-charging state and the identification of the transmitting device matches the predetermined transmitting device identification that has been assigned to the computing device, in which case the estimated location is the area within the range of the WLAN or other short range wireless signal of the predetermined transmitting device assigned to the computing device; or

the identification of the nearest transmitting device does not match the predetermined transmitting device identification that has been assigned to the computing device, in which case the estimated location is outside of the range of the WLAN or other short range wireless signal of the predetermined transmitting device assigned to the computing device.