CLAIMS

We claim:

1. A method of determining environmental context for a Global Navigation Satellite System (GNSS) receiver, comprising:
    - providing a set of characteristic features of received Global Navigation Satellite System (GNSS) signals to a computational model; and
    - determining, by the computational model, a specific environmental context of the GNSS receiver according to the set of characteristic features of the received GNSS signals

    wherein said determining comprises selecting the specific environmental context to correspond to an output of the computational model having a higher probability compared to other outputs of the computational model.

2. The method according to claim 1, wherein the computational model determines the specific environmental context from a group of environmental contexts comprising: a first outdoor context, a second outdoor context, and a third outdoor context.

3. The method according to claim 2, wherein the group of environmental contexts further comprises: a first indoor context.

4. The method according to claim 3, wherein the group of environmental contexts further comprises: a second indoor context.

5. The method according to any preceding claim, wherein the said characteristic features are obtained by statistically extracting three features of received GNSS signals to form three characteristic feature for received GNSS signals.

6. The method according to any preceding claim, wherein the set of characteristic features comprises statistical information corresponding to satellite angle, satellite signal strength and multipath indicator.

7. The method according to claim 6, wherein the set of characteristic features further comprises one or more of statistical information comprising number of satellite constellations.

8. The method according to claim 6 or 7, wherein the satellite angle comprises azimuth angle or elevation angle.

9. The method according to any of claims 6-8, wherein the satellite signal strength comprises signal to noise ratio (SNR) and/or or carrier to noise ratio (C/NO).

10. The method according to any of claims 6-9, wherein the set of characteristic features are obtained by:

obtaining statistical information characterizing the satellite angle or the satellite signal strength, comprising

obtaining a plurality of states having an associated probability for each of the satellite angle and the satellite signal strength.

11. The method according to claim 10, wherein obtaining the statistical information comprises

obtaining a probability distribution for the received GNSS signals, and

obtaining an indicator for each received GNSS signal to determine the presence of multipath.

12. The method according to claim 9 when dependent on claim 8 or any of claims 10-11 when dependent on claim 8 and claim 9, comprising:

for each time unit, given a number N of satellites which are sources of received GNSS signals, obtaining the probability of distribution for C/NO, the elevation angle and the multipath indicator.

13. The method according to claim 12, wherein for C/NO and for elevation angles, probability distribution of each is divided into probability bins.

14. The method according to claim 13, wherein there are seven probability bins for each of the probability distributions.

15. The method according to claim 14, wherein

for C/NO, the C/NO range is divided into said 7 bins being: [0 10; 10 18; 18 23; 23 28; 28 33; 33 38; 38 50];

for elevation angles, the range of 0-90 degrees is divided into 8 bins being: [0 14;14 24;24 34;34 44;44 54;54 64;64 74;74 90].

16. The method according to any of claims 12-15, wherein for multipath indicators, two bins are used which indicate multipath and not multipath respectively.

17. The method according to any preceding claim, wherein the method is performed by only one of : a GNSS receiver, an application processor of a mobile phone, a software application, a GNSS receiver and an application processor of a mobile phone, a GNSS receiver and a software application.

18. The method according to any preceding claim, further comprising:

performing an optimization action according to the specific environmental context of the GNSS receiver, wherein the optimization action comprises one or more of: performing satellite acquisition, performing baseband resource allocation, switching to an energy-saving mode, switching to a higher energy mode, activating multipath-detection module, determining GNSS receiver location, determining a route plan in a navigation application.

19. The method according to any preceding claim, further comprising:

re-determining or predicting, according to the specific environmental context of the GNSS, a location of the GNSS receiver.

20. A Global Navigation Satellite System (GNSS) receiver, comprising a GNSS receiver configured to perform any one of the methods of claims 1-19.