WE CLAIM,

1. An intelligently networked system for proactively monitoring various parameters, of one or more stochastic behaviours of users, in a defined environment, said system comprising:
    - a defined environment configured in respect of one or more reader mechanisms (RM), installed at pre-defined locations, in said defined environment, each reader mechanism (RM) being configured to read a wearable mechanism (WM) tagged to a user;
    - one or more wearable mechanisms (WM), each wearable mechanism (WM) being tagged to a corresponding user in said defined environment, each wearable mechanism (WM) comprising a location tag for a person;
    - one or more mobile devices (MD), each mobile device (MD) being associated to a corresponding user in said defined environment;
    - monitoring a first stochastic behaviour, of said user, using sensed data of said mobile device (MD) associated with said user, in said defined environment, in terms of at least a first risk potential level (RPL1);
    - monitoring a second stochastic behaviour, of said user, using sensed data of said wearable mechanism (WM) tagged to said user, in said defined environment, said wearable mechanisms (WM) are tags, associated with corresponding unique identifiers, which communicate with said reader mechanisms (RM), said monitoring a second stochastic behaviour being in terms of at least an instance of social distance non-compliance (SDNC);
    - a communicably coupled processor (P) being configured with a rule engine (RE) and a notification engine (NE), said processor (P) configured to receive:
        - sensed data from each of said wearable mechanisms (WM) in association with user identity;
        - sensed data from each of said mobile devices (MD) in association with user identity;
        - sensed data from each of said reader mechanisms (RM) in association with defined environment identity;

- said rule engine (RE) configured to define rules in relation to thresholds, along with rules in relation to severity of breach of said defined thresholds, for one or more parameters associated with said first risk potential level (RPL1) and for one or more parameters associated with said social distance non-compliance (SDNC); and
- said notification engine (NE) configured to provide notifications in relation to breach of one or more thresholds, along with severity of breach of said thresholds, along with identity of associated user.

2. The system as claimed in claim 1, wherein said defined environment is configured with reader mechanisms (RM), one or more reader mechanisms being located:
    - at entry point(s) of said defined environment in order to tag, a second node based sensed entry data, in terms of person identifier and time;
    - at exit point(s) of said defined environment in order to tag, a second node based sensed exit data, in terms of person identifier and time; and
    - at pre-defined locations throughout said defined environment in order to tag, a second node based person-movement data, in terms of person identifier and time.

~~3. The system as claimed in claim 1, wherein said wearable mechanisms (WM) are tags, associated with corresponding unique identifiers, which communicate with said reader mechanisms (RM).~~

~~4.~~3. The system as claimed in claim 1, wherein said wearable mechanisms (WM) comprise a set of first sensors, the sensors are, contact sensors, pulse oximeter sensors, body temperature sensors, skin temperature sensors, and fitness tracking sensors, with sensing being done at pre-determined discrete time intervals.

~~5.~~4. The system as claimed in claim 1, wherein said wearable mechanisms (WM) are configured to collect distance measurements at pre-defined time frequencies and further configured by said notification engine (NE) along with said rule engine (RE) to send alerts to a corresponding user wearing said wearable mechanism (WM), which are dependent on the severity of threshold breach defined in said rule engine (RE).

~~6.~~5. The system as claimed in claim 1, wherein said wearable mechanisms (WM) are Ultra-Wide Band (UWB) real time locating systems that comprise said~~a~~ location tag for a person, or said location anchors.

~~7.~~6. The system as claimed in claim 1, wherein, said reader mechanisms (RM), that are a combination of Ultra-Wide Band (UWB) enabled mechanisms and Bluetooth (BLE) enabled mechanisms, are installed near a ceiling of a defined environment.

~~8.~~7. The system as claimed in claim 1, wherein said reader mechanisms (RM), that are Bluetooth (BLE) enabled mechanism, are installed more than 6 metres above ground in a defined environment.

~~9.~~8. The system as claimed in claim 1, wherein said mobile devices (MD) are configured with a set of second sensors, that sense one or more physiological parameters of a user; that is selected from a group of sensors, which include heart rate variability sensors, heart rate sensors, body temperature sensors, and skin temperature sensors.

~~10.~~9. The system as claimed in claim 1, wherein said rule engine (RE) is configured to determine rules, and corresponding notifications, in respect of stochastic behaviour, in terms of temperature, of a user, said rule engine (RE) being configured to:

- determine rules relating to temperature spikes as sensed by said mobile devices (MD) and / or said wearable mechanisms (WM), allowable temperature ranges as sensed by said mobile devices (MD) and / or said wearable mechanisms (WM), disallowable temperature ranges as sensed by said mobile devices (MD) and / or said wearable mechanisms (WM), and instances where said rule engine (RE) needs to communicate with said notification engine (NE) to raise a user-identified flag of alarm in terms of temperature faults (TF).

~~11.~~10. The system as claimed in claim 1, wherein said rule engine (RE) is configured to determine rules, and corresponding notifications, in respect of stochastic behaviour, in terms of space, of a user, said rule engine (RE) being configured to:

- determine rules relating to distances between persons identified by determining readings provided by said reader mechanisms (RM) in association with users' wearable mechanisms (WM), allowable distances in terms of such readings, and instances where said rule engine (RE) needs to communicate with said notification engine (NE) to raise a user-identified flag of alarm in terms of social distancing faults (DF); and
- determine rules relating to defining various zones within said defined environment in concurrence with said reader mechanisms (RM) per zone.

~~12.~~11. The system as claimed in claim 1, wherein said rule engine (RE) is configured to determine rules, and corresponding notifications, in respect of stochastic behaviour, in terms of patterns, of a user, said rule engine (RE) being configured to:

- determine rules relating to a user's frequency of use of sanitization stations paired with said reader mechanisms (RM), that is determined by said user's wearable mechanism (WM) over a period of time, allowable thresholds in terms of such readings, and instances where said rule engine needs to communicate with said notification engine (NE) to raise a user-identified flag of alarm in terms of sanitization faults (SF).

~~13.~~12. The system as claimed in claim 1, wherein said system comprising a grouping module (GM) engaged in order to group a set of reader mechanisms (RM) per zone and rules being configured with respect to such defined zones by said rule engine (RE).

~~14.~~13. The system as claimed in claim 1, wherein said wearable mechanisms (WM) or said mobile devices (MD) are configured with a display mechanism (D) to receive notifications from said processor (P), in terms of determined faults being temperature faults (TF), social distancing faults (DF), and / or sanitization faults (SF).

~~15.~~14. The system as claimed in claim 1, wherein said processor (P) is configured to receive sensed data from:

- at least a first input obtained from said wearable mechanisms (WM), said reader mechanisms (RM), and said mobile devices (MD); and
- at least a second input, obtained from a dashboard, in relation to thresholds for each parameter of sensed data, in order to determine temperature faults, social distancing faults, and / or sanitization faults.

~~16.~~15. The system as claimed in claim 1, wherein said "first risk potential level" (RPL1) is determined from the sensed physiological parameters obtained from the wearable mechanisms (WM) and / or the mobile devices (MD), said "first risk potential level" (RPL1) being determined according to administrator-defined thresholds for each sensed parameter.

~~17.~~16. The system as claimed in claim 1, wherein said instance of "social distance non-compliance" (SDNC) is determined from said reader mechanisms (RM) in communication with said tagged wearable mechanisms (WM), said instance of "social distance non-compliance" (SDNC) being determined according to administrator-defined thresholds of disallowable distance between any two tagged wearable mechanisms (WM) in a same defined environment.

~~18.~~17. The system as claimed in claim 1, wherein said mobile device (MD) comprising:

- Video Acquisition modules (603, 604), associated with respective mobile wrappers (601, 602), to extract video feed from said mobile devices (MD1, MD2), said mobile wrappers (601, 602) configured to feed frames into a software development kit (SDK) library (605) responsible for processing;
- a Session Manager (SM) within a SDK library (L) for managing processing sessions and for initiating video feed processing in a Session System;
- said Session System (SS) comprising:
    - a face detection and tracking module (606),
    - am image processing module (607),
    - a PPG extraction module (608), and
    - a PPG signal processing module (609);
- an output module configured to output data from said Session System (SS), said output

data comprising heart rate (HRC), heart rate variability (HRVC), oxygen saturation (O2C), and respiratory rate (RRC); and

- said Session Manager (SM) configured to pass said output data to said mobile wrappers (601, 602) that in turn share said outputs with respective mobile devices (MD1, MD2).

~~19.~~18. The system as claimed in claim 16, wherein said system comprising an SDK comprising:

- a PPG signal extraction and processing component (SM, PC) further comprising:
    - a Session Manager (SM) containing a face tracking algorithm, which identifies regions of interests from a user's face (forehead, left and right cheek) and extracts RGB signals from a video feed of said mobile device's (MD) camera; and
    - a PPG Calculator (PC) configured to receive data from said Session Manager (SM), said PPG Calculator (PC) containing:
        - a signal calculation module, configured to average RGB values across all pixels, to give temporal RGB signals;
        - a signal interpolation module, configured to receive said RGB values, in order to apply mathematical functions to the RGB signals to combine the 3D RGB signals into 1D PPG signals and subsequently transform the PPG signal into the frequency domain; and
        - a signal pre-filtering module, configured to receive signals from said signal interpolation module, in order to remove any outlier signals;
        - a PPG signals storage bucket to store filtered signals from said signal pre-filtering module; and
- a physiological parameters calculation component (O2C, HRC, HRVC, RRC), configured to receive filtered signals from said PPG signals storage bucket, said physiological parameters calculation component comprises a multitude of calculation algorithms for each of the sensed physiological parameters, which include an oxygen saturation calculator (O2C), a heart rate calculator (HRC), a heart rate variability calculator (HRVC), and respiratory rate calculator (RRC).