

CLAIMS

1. A system (10) for handling events of a fleet (20) of personal mobility devices (200) (PMDs), the system (10) comprising:
 - the fleet (20) comprising the personal mobility devices (200);
 - a server (100) configured to receive live data (250) from the fleet (20) of PMDs (200);
 - a first memory (300), wherein the server (100) is further configured to store the live data in the first memory (300), which is accumulated as part of historical data, wherein the server (100) comprises a processing logic (110) comprising a classifier configured to provide prediction data (130) based on at least one of:
 - the historical data, the live data,wherein the live data (250) comprises live status data and live alarm data, and wherein the prediction data (130) comprises prediction status data and prediction alarm data; and
 - an event processor (120) configured to process an alarm of the live alarm data or the prediction alarm data, and send an alert to one or more receiver applications of a plurality of receiver applications (400), wherein each PMD (200) comprises a standalone vehicle and an IoT device (210) attached to the standalone vehicle, the standalone vehicle comprising a power controller (220), wherein the IoT device (210) and the power controller (220) are communication coupled to each other, and wherein the live data comprises first data (251) originating from the power controller (220) and second data (252) originating from the IoT device (210) of a PMD (200) of the fleet (20).
2. The system (10) of claim 1, wherein the server (100) is configured to request live data, from each of the PMDs (200) which are operational, repeatedly at a pre-defined time interval.

3. The system (10) of claim 1 or claim 2, wherein each PMD (200) of the fleet (20) is configured to send the live alarm data independently of a server (100) request to the server when an alarm event has occurred.
4. The system (10) of any of the previous claims, wherein the live alarm data and the prediction alarm data are of an alarm data type, and wherein the alarm data type is different from a data type of the live status data and a data type of the predicted status data.
5. The system (10) of any of the previous claims, wherein the first data is generated by the power controller (220) based on signal from OEM sensors (222), which optionally include one or more of: battery sensor, accelerator sensor, brakes sensor.
6. The system (10) of any of the previous claims, wherein the second data is generated by the IoT device based on at least one of:
 - signal from IoT sensors (212);
 - first data received from the power controller (220);
 - a combination thereof.
7. The system (10) of claim 6, wherein the IoT sensors include at least one of: accelerometer, GPS sensor, battery voltage sensor.
8. The system (10) of claim 7, wherein second data comprises a joint accelerometer-GPS data which is based on accelerometer data from the accelerometer and on GPS data from the GPS sensor.
9. The system (10) of any of claims 6 to 8, wherein second data comprises one or more of: data of road bumps, travel length, travel route, speed, acceleration, brake distance, brake speed, battery voltage, alarms which are triggered and self-resolved.
10. The system (10) of any of the previous claims, wherein the event processor (120) comprises a trouble-shooter logic (112) and an event router (114), wherein the trouble-shooter logic is configured to carry out troubleshooting an issue related to the alarm, by trying to re-establish communication with a PMD (200) with which communication is lost, and by communicating with a problematic PMD (200) to resolve or mitigate the issue, and is further configured to generate a result of the troubleshooting.

11. The system (10) of claim 10, wherein the event router (114) is configured to, based on a criticality level of the alarm and/or on the result of the troubleshooting, send an alert to the one or more receiver applications of the plurality of receiver applications (400).
12. The system (10) of any of the previous claims, wherein the plurality of receiver applications (400) comprises: operations team application (410), user application (420), maintenance team application (430).
13. The system (10) of any of the previous claims, wherein the processing logic (110) includes a categorizer configured to, receive the historical data and/or the live data, and attribute a category to the respective data: battery, brakes, speed, road conditions, which categories are input into the classifier.
14. The system (10) of any of the previous claims, wherein historical data further comprises user historical data.
15. The system (10) of any of the previous claims, wherein prediction data comprises a number of braking for a trip.
16. The system (10) of any of the previous claims, wherein prediction data comprises at least one of: a risk level for a user, a risk level for a trip, a risk level for a PMD (200).
17. The system (10) of any of the previous claims, wherein each of the power controller (220) and the IoT device comprises a respective security engine (216, 226) configured to provide encrypted communication with each other.
18. The system (10) of any of the previous claims, wherein the server (100) comprises a server (100) side encryption engine (116) and each IoT device of each of the PMDs (200) comprises an IoT side encryption engine (218), the server (100) side encryption engine being and the IoT side encryption engines (218) configured to provide encrypted communication with each IoT device.
19. The system (10) of claim 1, wherein live data (250) is generated based on a battery voltage, wherein the prediction status data comprises a battery fault prediction and/or wherein the prediction alarm data comprises a battery fault prediction alarm.

20. The system (10) of claim 19, wherein the IoT sensors (21) comprise a battery voltage sensor, and the second data is generated by the IoT device based on at least signal from the battery voltage sensor.

21. The system (10) of any of the previous claims, wherein PMD (200) is an electric scooter.

22. A method (810) for handling events of a fleet (20) of personal mobility devices (200) (PMDs), wherein each PMD (200) comprises a standalone vehicle and an IoT device (210) attached to the standalone vehicle, the standalone vehicle comprising a power controller (220) configured to generate first data (251), and the IoT device (210) being configured to generate second data (252), the method (810) comprising:

- receiving at a server (100) live data (250) from the fleet (20) of PMDs (200);
- storing the live data (250) in the first memory (300) as part of historical data;
- providing, by a classifier comprised in a processing logic (110) of the server (100), prediction data based on at least one of: the historical data, the live data, wherein the live data comprises live status data and live alarm data, and wherein the prediction data (130) comprises prediction status data and prediction alarm data; and
- processing, by an event processor (120), an alarm of the live alarm data or the prediction alarm data into an alert and sending the alert to one or more receiver applications of a plurality of receiver applications (400), wherein the live data comprises the first data (251) and the second data (252).

23. The method (810) of claim 22, wherein the server (100) requests live data, from each of the PMDs (200) which are operational, repeatedly at a pre-defined time interval.

24. The method (810) of claim 22 or claim 23, wherein each PMD (200) of the fleet (20) sends the live alarm data independently of a server (100) request to the server when an alarm event has occurred.

25. The method (810) of any of claims 22 to 24, further comprising
carrying out, by a trouble-shooter logic (112) comprised by the event processor (120), troubleshooting an issue related to the alarm, by trying to re-establish communication with a

PMD (200) with which communication is lost, and by communicating with a problematic PMD (200) to resolve or mitigate the issue, and generating a result of the troubleshooting.

26. The method (810) of any of claims 22 to 25, further comprising sending, by the event router (114) comprised by the event processor (120), an alert to the one or more receiver applications of the plurality of receiver applications (400) based on a criticality level of the alarm and/or on the result of the troubleshooting.

27. The method (810) of any of claims 22 to 26,
further comprising, receive the historical data and/or the live data by a categorizer included in the processing logic (110), and attributing, by the categorizer, a category to the respective data: battery, brakes, speed, road conditions, and
further comprising inputting the categories into the classifier.

28. The method (810) of any of claims 22 to 27, wherein live data (250) comprises live battery data, wherein the prediction status data comprises a battery fault prediction and/or wherein the prediction alarm data comprises a battery fault prediction alarm.

29. The method (810) of claim 28, wherein live battery data is based on a battery voltage obtained by a battery voltage sensor comprised by the IoT sensors (21).

30. The method (810) of any of claims 23 to 29, wherein PMD (200) is an electric scooter.