

What is claimed is:

1. A system for detecting wetness on a surface comprised of:
 - a) at least one sensor for detecting surface temperatures, wherein each sensor partitions the surface into multiple non-overlapping zones of pixels, wherein sensing parameters in each zone are independently modified, wherein the at least one sensor comprises a memory unit and fluid detection unit, wherein the at least one sensor is installed on one or more walls and/or ceilings;
 - b) a database for storing surface temperature data;
 - c) an interface; and
 - d) a processor comprising a data capture module, a fluid detection module and a belief update module;

wherein the processor identifies baseline temperatures of surfaces in each zone;

wherein the fluid detection module identifies wetness as aberrations from baseline temperatures of surfaces in each zone;

wherein the fluid detection module reads a data buffer from the memory unit and segregates data for each zone, wherein features are calculated for each zone, wherein the features comprise a temporal tracking of each pixel's thermal data over time;

wherein the belief update module aggregates all pixels in each zone that are crossing a belief threshold value to result in a positive wetness detection;

wherein a fluid type inference, a spill type inference, an area threshold check, a time threshold check and similarity threshold is performed on the detected wetness to indicate if an alert is to be generated; and

wherein the processor schedules cleaning and/or maintenance based upon the generation of the alert when wetness on the surface reaches or exceeds a threshold level.
2. The system of claim 1, wherein the at least one sensor is a thermal sensor or thermopile array that records thermal images of the surface of the facility.

3. The system of claim 1, wherein the at least one sensor has sampling rates that are time based and/or event based.
4. The system of claim 1, wherein the at least one sensor further comprises a sensing element and a data interchange unit.
5. The system of claim 1, wherein the at least one sensor has sampling rates that are adjusted based on patterns of facility use.
6. The system of claim 1, wherein the surface is a floor, shelf, table top, sink, panel, appliance top or counter top.
7. The system of claim 1, wherein thermal characteristics of wetness are detected by the at least one sensor; and
wherein the processor identifies fluid comprising the wetness and/or a source of wetness based on the thermal characteristics.
8. The system of claim 1, wherein the surface is in a facility, wherein the facility is a washroom, kitchen, lounge, dining area, conference center, auditorium, gym, recreational area, market, shop, elevator/lift, interior of a vehicle or other gathering area.
9. A computer implemented method for detecting wetness on a surface comprising of steps of:
 - a) collecting data on surface temperatures using at least one sensor, wherein each sensor partitions the surface into multiple non-overlapping zones of pixels, wherein sensing parameters in each zone are independently modified, wherein the at least one sensor comprises a memory unit and fluid detection unit, wherein the at least one sensor is installed on one or more walls and/or ceilings;
 - b) identifying baseline surface temperatures in each zone with a processor comprising a data capture module, a fluid detection module and a belief update module, wherein the fluid detection module reads

a data buffer from the memory unit and segregates data for each zone, wherein features are calculated for each zone, wherein the features comprise a temporal tracking of each pixel's thermal data over time;

- c) identifying wetness as aberrations of baseline surface temperatures in each zone, wherein the belief update module aggregates all pixels in each zone that are crossing a belief threshold value to result in a positive wetness detection; wherein a fluid type inference, a spill type inference, an area threshold check, a time threshold check and similarity threshold is performed on the detected wetness to indicate if an alert is to be generated;
- d) comparing data on wetness from at least two time points to improve belief; and
- e) alerting one or more workers and/or stakeholders when wetness on the surface reaches or exceeds a threshold level.

10. The method of claim 9, wherein the at least one sensor is a thermal sensor or thermopile array that records thermal images of the floor or surface of the facility.

11. The method of claim 9, wherein the step of collecting data on surface temperatures from at least one sensor has sampling rates that are time based and/or event based.

12. The method of claim 9, wherein the step of identifying wetness as aberrations of baseline surface temperatures accounts for variables including heat from the environment such as sunlight and wind, human body heat, heat from electrical sources and/or heat from light sources.

13. A computer implemented method for identifying fluid in wetness on a floor or surface comprising of steps of:

- a) collecting data on thermal characteristics of wetness using at least one sensor, wherein each sensor partitions the floor or surface into multiple non-overlapping zones of pixels, wherein sensing parameters in each zone are independently modified, wherein the at

least one sensor comprises a memory unit and fluid detection unit, wherein the at least one sensor is installed on one or more walls and/or ceilings;

- b) compiling a database of thermal signatures of fluids based on thermal properties exhibited on one or more surfaces;
- c) identifying fluids in each zone by comparing thermal signatures of known fluids in the database, wherein a fluid detection module in a processor reads a data buffer from the memory unit and segregates data for each zone, wherein features are calculated for each zone, wherein the features comprise a temporal tracking of each pixel's thermal data over time, wherein a belief update module in the processor aggregates all pixels in each zone that are crossing a belief threshold value to result in a positive wetness detection; wherein a fluid type inference, a spill type inference, an area threshold check, a time threshold check and similarity threshold is performed on the detected wetness to indicate if an alert is to be generated;
- d) comparing wetness detection results from at least two time points to improve belief; and
- e) alerting one or more workers and/or stakeholders with information on the fluid.

14. The method of claim 13, wherein the step of identifying fluids by comparing thermal signatures of known fluids in the database accounts for variables including heat from the environment such as sunlight and wind, human body heat, heat from electrical sources and/or heat from light sources.

15. The method of claim 13, wherein an algorithm is used in the step of identifying fluids by comparing thermal signatures of known fluids in the database, wherein the algorithm uses frequency domain techniques, time domain techniques or a hybrid approach.

16. The method of claim 13, wherein the step of identifying fluids by comparing thermal signatures of known fluids in the database further comprises a step of learning and maintaining an estimate of trends.

17. The method of claim 13, further comprising a step of maintaining a historical record of data.
18. The method of claim 13, further comprising a step of activating one or more autonomous or self-cleaning systems based on an identified fluid.
19. The method of claim 13, wherein the fluid is water, sweat, oil, paint, vomit, urine, blood and/or a beverage intended for human consumption.
20. The method of claim 9 or 13, including a step of segregating a field of view of the at least one sensor into contiguous areas of thermal properties using a continuity criterion of baseline temperatures.