CLAIMS

1. A sensor comprising a plurality of pixels, wherein each pixel is a photovoltaic cell arranged to output an analog signal that is dependent on a time of illumination and a change of light intensity on said pixel by a light source, and the sensor tracks a movement of the light source based on the change of light intensity and determines a direction of the movement based on which said pixels are illuminated by the light source.

2. A sensor according to claim 1, wherein the plurality of pixels comprises at least a subset of fault-tolerant pixels for which the output analog signal varies by less than a threshold over a predetermined range of illumination intensities.

3. A sensor according to claim 2, wherein said fault-tolerant pixels have a charge recombination rate such that the output analog signal varies by less than the threshold over the predetermined range of illumination intensities.

4. A sensor according to any one of the preceding claims, wherein each pixel is connected to a transistor for multiplexed readout of respective analog signals of respective pixels.

5. A sensor according to any one of claims 1 to 3, wherein one or more pixels are connected to a respective counter electrode for simultaneous readout of respective analog signals.

6. A sensor according to any one of the preceding claims, wherein each pixel is a dye-sensitized photovoltaic cell (DSSC).

7. A sensor according to claim 6, wherein the DSSC comprises an electrolyte containing a redox couple.

8. A sensor according to claim 6, wherein the DSSC comprises a solid state charge transport layer containing a redox couple.

9. A sensor according to claim 7 or 8, wherein an oxidizing species of the redox couple is present in an amount that is less than that of a reducing species of the redox couple, to thereby lower the charge recombination rate of the photovoltaic cells.

10. A sensor according to claim 9 when dependent on claim 7, wherein the electrolyte contains only a reducing agent, such that the oxidizing species is only generated on dye regeneration during illumination.

11. A sensor according to any one of the preceding claims, wherein each pixel is associated with a photodetector for measuring light intensity at said pixel.

12. A sensor according to claim 11, wherein respective photodetectors are located alongside respective pixels.

13. A sensor according to claim 11, wherein respective photodetectors are located within respective pixels.

14. A sensor according to claim 11, wherein the pixels are arranged in a first array and the photodetectors are arranged in a second array; and wherein the second array overlies the first array such that the photodetectors are in register with the pixels.

15. A sensor according to any one of claims 11 to 14, wherein the photodetectors are photodiodes.

16. A sensor according to any one of the preceding claims, wherein the analog output signal is an open circuit voltage V_{OC} or short circuit current I_{sc} of the photovoltaic cell.

17. A sensor according to any one of claims 11 to 15, wherein the time of illumination corresponds to a light dwelling time of light from the light source on the respective said pixel, the sensor comprising a processor for determining a speed of the light source based on the light dwelling time of one or more said pixels.

18. A sensor according to claim 2 or 3, comprising a processor for identifying an object based on the analog output signal of the fault-tolerant pixels.

19. A sensor according to claim 2, 3 or 18, wherein the threshold is zero.

20. A sensor according to claim 2, 3, 18 or 19, wherein each fault-tolerant pixel is a photocapacitor.