CLAIMS

1. An apparatus (100) for determining characteristics of a fluid, the apparatus (100) comprising:

a visible light producing LED array to emit light and produce a light beam for irradiating an object;

an optical system comprising:

a grating (106) to receive irradiated light from the object through a collimator (108) and disperse the light into wavelengths;

a focusing lens (104); and

a linear image sensor (102) arranged at a focal plane of the focusing lens (104) to convert the light received by the grating (106) and focused by the focusing lens (104), into electrical signals;

a microcontroller connected to the linear image sensor (102) to process the electrical signals into digital signals and communicate the digital signals;

a remote application which collects the digital signals from the microcontroller and processes the digital signals through a signal processing technique; and

a remote server trained on datasets to collect the processed signal and predict a value for the fluid defined by one or more of haemoglobin, bilirubin, oxygen saturation, creatinine, and random blood glucose, wherein the trained remote server deploys a data model with probability factors for determining the characteristics of the fluid including: the value of the haemoglobin, bilirubin, oxygen saturation, creatinine, and random blood glucose from the processed signal.

2. The apparatus (100) as claimed in claim 1, wherein the LED array is defined by 440-660 nm and a color temperature 7000 K.

3. The apparatus (100) as claimed in claim 1, wherein the grating (106) is configured to be used with a spectral analyzer of 340 to 850 nm, 288 pixels based with 15 nm resolution and configured to distribute the reflected light from the object to whole spectra from 310 to 850 nm.

4. The apparatus (100) as claimed in claim 1, wherein the LED array corresponds to a white LED ring, a combination of 6 LEDs of luminous intensity of 18 mcd placed angularly to produce a concentrated light beam.

5. The apparatus (100) as claimed in claim 1, wherein the LED array is configured to pass a visible white light to an inner side of a ring finger of a subject and penetrate through a finger-tip by passing epidermis and contact concentrated peripheral blood.

6. A method (400) of determining characteristics of a fluid, the method (400) comprising:

emitting (402) light by a visible light producing LED array and producing a light beam for irradiating an object;

receiving (404), from a grating (106) of an optical system, irradiated light from the object through a collimator (108) and dispersing the light into wavelengths;

converting (406) the light into electrical signals, by a linear image sensor (102) arranged at a focal plane of a focusing lens (104) in the optical system by the grating (106), and focusing by the focusing lens (104);

processing (408) the electrical signals into digital signals by a microcontroller connected to the linear image sensor (102) and communicating the digital signals;

collecting, by a remote application, the digital signals from the microcontroller and processing the digital signals through a signal processing technique; and

collecting the processed signal by a remote server trained on datasets and predicting a value for the fluid defined by one or more of haemoglobin, bilirubin, oxygen saturation, creatinine, and random blood glucose, wherein the trained remote server deploys a data model with probability factors for determining fluid characteristics of the fluid including: the value of the haemoglobin, bilirubin, oxygen saturation, creatinine, and random blood glucose from the processed signal.

7. The method (400) as claimed in claim 6, wherein the LED array is defined by 440-660 nm and a color temperature 7000 K.

8. The method (400) as claimed in claim 6, wherein the grating (106) is configured to be used with a spectral analyzer of 340 to 850 nm, 288 pixels based with 15 nm

resolution and configured to distribute the reflected light from the object to whole spectra from 310 to 850 nm.

9. The method (400) as claimed in claim 6, wherein the LED array corresponds to a white LED ring, a combination of 6 LEDs of luminous intensity of 18 mcd placed angularly to produce a concentrated light beam.

10. The method (400) as claimed in claim 6, further comprising:

passing a visible white light by the LED array to an inner side of a ring finger of a subject and penetrating through a finger-tip by passing epidermis and contacting concentrated peripheral blood.