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Exercise 4: Luminosity sensor

Attached to this document is VISHAY ambient light sensor TEMD6200FX01 spec sheet.
(<http://www.vishay.com/docs/81812/temd6200.pdf>)

- 1) Where is the transfer function of this sensor?

Basic Characteristics, Fig 1

- 2) What are the units of the measurand and the one of the signal?

measurand: Illuminance [lx]; one of the signal: reverse light current (mA)

- 3) What is the random error of this sensor?

~~temperature~~

- 3) What is the sensor's systematic error?

~~Hardware loss.~~

- 4) What is the sensor range?

angle of half sensitivity: $\pm 60^\circ$

the wavelengths of sensor: 430 to 610 nm.

Exercise 5: QUANTIFIED SELF project

Find an own "quantified self" device using an electromagnetic sensor, any wavelength is ok (visible - or not)

- 1) Find and describe your proper project (do not describe an existing project)

- 2) Define the specifications needed for your electro-magnetic sensor

- 3) Find a sensor which fulfills your specs (URL). If you don't find any sensor fulfilling your specs, take the best one you find and explain why it is not sufficient.

1) Emotion Quantification Bracelet: a wearable device designed, utilizes an electromagnetic sensor to provide real-time biofeedback to users by measuring and analyzing signals of the body, working for analyze physiological & psychological states and issue alerts. 2) Wide Frequency Range; High Sensitivity; Real-Time Processing; stabilisation. 3) URL: ~~ADE9003~~ Teslameter TS10: High accuracy, wide frequency range, real-time, stable; but need additional calibration work.

→ example IOT wearable example.

1) Emotion Quantification Bracelet (Networking).

2) Wireless network:

Bluetooth: Low Energy, for short-range communication

Wi-Fi: for more extended range communication.

- ② A wireless standard that aligns with the power consumption constraints of the wearable device.
- ③ Ensure the security of information transmission.
- ④ Cost as low as possible.

3) Bluetooth Low Energy:

- ① Low Power Consumption: can be used for a long time.
- ② Short Range: sufficient for communication between the wearable device and smart devices.
- ③ Widespread Compatibility: BLE is supported by many devices.

Wi-Fi

- ① Higher Data Transfer Rates: can transfer large amounts of data to the cloud for emotion analysis.
- ② Large Range: cover a larger range than BLE.
- ③ Cloud Connectivity: enable direct connectivity to the internet, when a strong abnormality in the data, an alert can be sent to the hospital.

