

Low-cost thermal imager for plant phenotyping

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This work uses a Flir Lepton 3 longwave infrared imager integrated with a Raspberry Pi computer to produce thermal images of crops. The longwave infrared sensor can detect the thermal radiation emitted by objects near room temperature and then determine its temperature. The data acquired is sent through Serial Peripheral Interface (SPI) communication to the computer and with this data a false-color image of 160x120 pixels is created. With the generated thermal images the status of the plants can be evaluated and it may be possible to predict drought or salt stress, for example. This technique has great advantages because it is a non-invasive, non-contact and non-destructive way of determine the quality of the crops. Another advantage is its low-cost and its small size, the hardware of the project costs less than \$ 400,00 and it is composed by a Flir Lepton 3 that measures 10.5 x 11.7 x 6.4 mm, a Raspberry Pi model 2B with 85.60 x 56 x 21 mm and a Flir Lepton Breakout Board to integrate them.

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