Battery-free Visible Light Sensing

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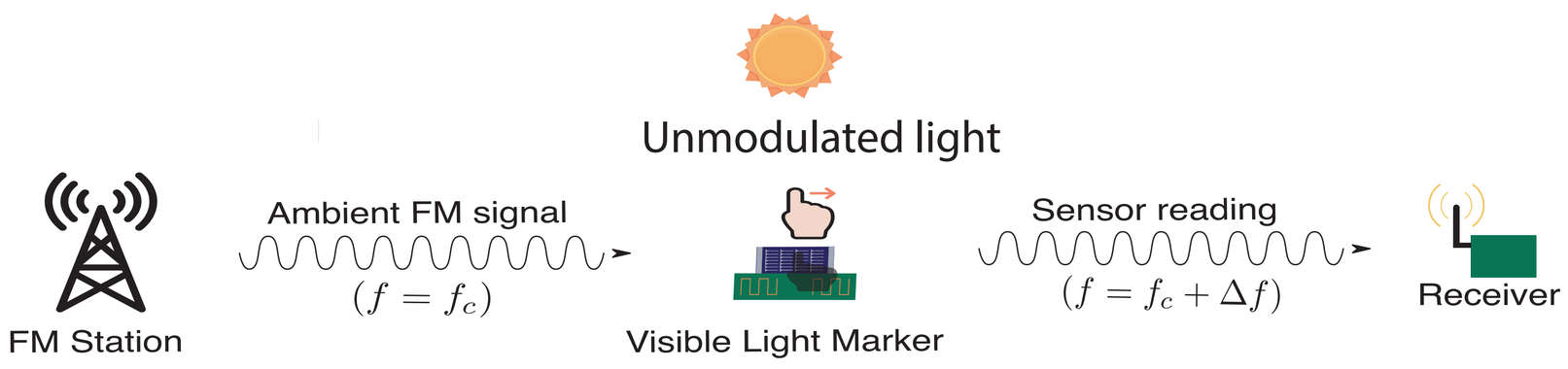
HIGHLIGHT

- ✓ Visible light sensing enables new capabilities such as hand gesture recognition and human pose reconstuction. Existing light sensing mechanisms are energy expensive (mWs).
- ✓ Photodiodes and amplifiers are energy expensive. Solar cells enable visible light sensing at near zero power, enables energy harvesting for battery-free operations.
- ✓ ADC operations are energy expensive. Thresholding circuit digitises at sub µW.
- ✓ Processing is significantly more energy expensive compared to backscatter transmissions.

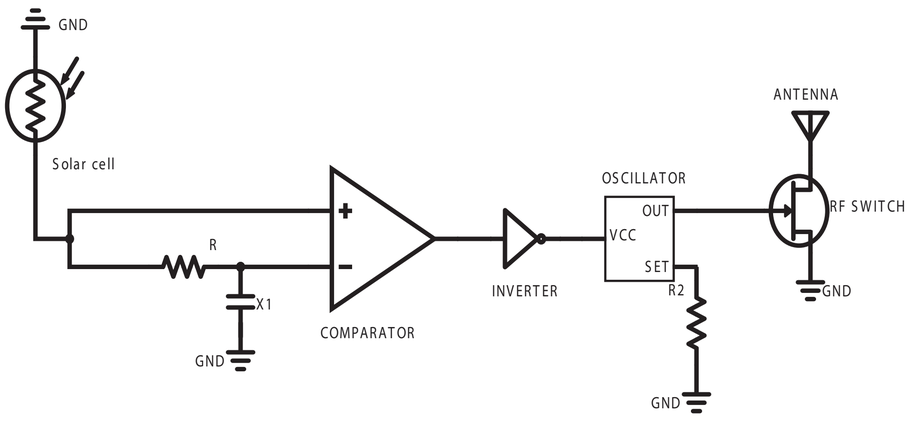
  We eliminate local processing and can transmit without requiring a computational block.

BATTERY-FREE VISIBLE LIGHT SENSING

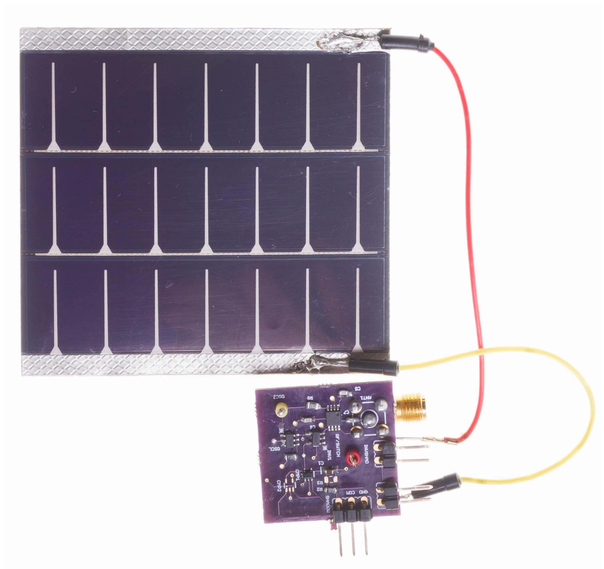


We can detect and communicate shadow events by reflecting ambient RF signals at a total power consumption of 20 µWs.

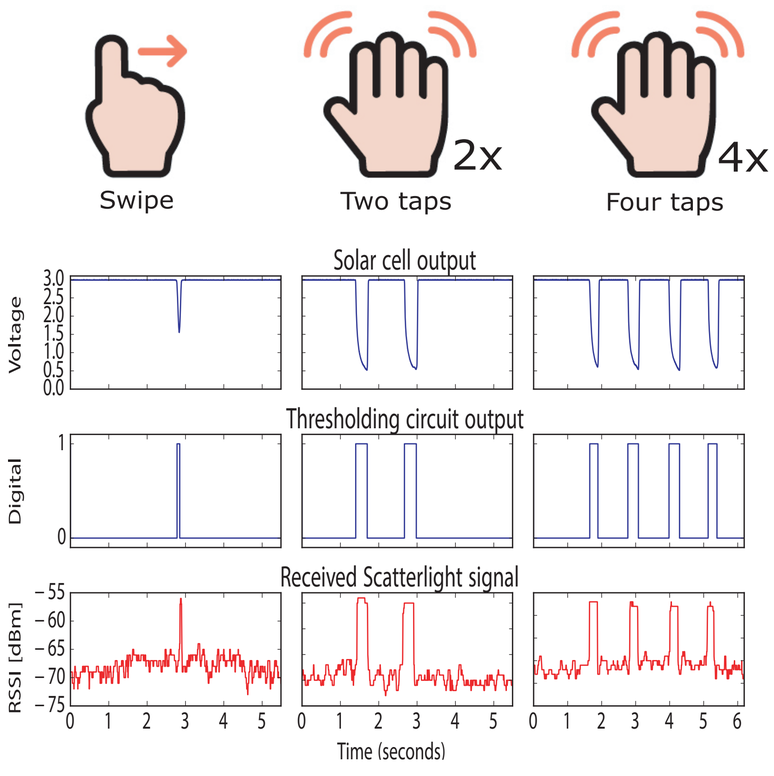
SCHEMATIC



PROTOTYPE



GESTURE RECOGNITION



COMMUNICATION RANGE