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# Internet of Things in Textile Sensors

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## Introduction

- The digitization of textiles (textronics) has created new opportunities for integration with conformable sensors to enable unobtrusive, noninvasive, and continuous decoding of vital body signals.
- This study offers an analysis of the IoTs' textile sensors and the fabrication techniques utilized for textronic sensors according to the form factors of fiber, yarn, fabric, and clothes.
- Figure 1 shows the reflected mode.

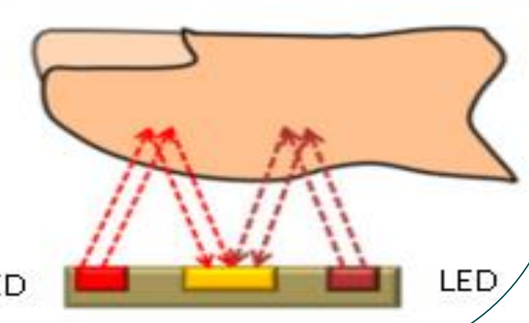
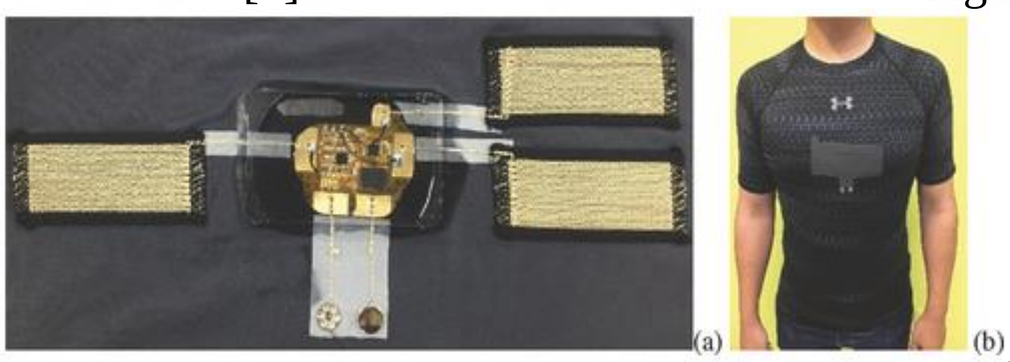



Figure 1

## Electronic Textile Sensor for Decoding Vital Body Signal

- By 2025, it is expected that the wearable biosensor market will have grown at an unprecedented rate to exceed $5 billion annually.
- As of now, no researches have statistically demonstrated the state-of-the-art in relation to the characterisation requirements for textile sensors in particular [1].
- Example of textronic sensors, Monitoring ECG, respiration, temperature and motion sensing. Figure 2 shows a) inner side, b) outer side [2].

Figure 2




## Form Factors and Fabrications of Textile Sensors

A. Smart Fibers: The two most common form factors are staple fiber and filaments [3].
B. Smart Yarns Filaments: Optoelectronics and electrode yarns are combined via weaving, stitching, adhesive coating, and polymer encapsulating processes to create physiological sensors.
C. Smart Fabrics: For creating printed electrodes or conductive interconnects with PCBs on fabrics and flexible substrates, stencil printing is much more straightforward to use.
D. Smart Garments: The flexible poly-SEBS substrate, along with conductive composite inks and CNT networks, were used to create the sticker-like sensor tags, which demonstrated good sensitivity and stretchability (up to 50%).

## Conclusion

The study comes to the conclusion that textile-based sensors that can be worn on the human body can be utilized as smart sensing devices to access the internet in addition to being able to send information.

## References

[1] Shuvo, et al. "Electronic Textile Sensors for Decoding Vital Body Signals: State-of-the-Art Review on Characterizations and Recommendations." Advanced Intelligent Systems 4.4 (2022): 2100223.
[2] Tao, Xuyuan, et al. "Bluetooth Low Energy-Based Washable Wearable Activity Motion and Electrocardiogram Textronic Monitoring and Communicating System." Advanced Materials Technologies 3.10 (2018): 1700309.
[3] Oh, Hyun Ju, et al. "Fabrication of piezoelectric poly (l-lactic acid)/BaTiO3 fibre by the melt-spinning process." Scientific Reports 10.1 (2020): 1-12.

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