

## Accepted Manuscript

Title: Robust and High-Performance Soft Inductive Tactile Sensors based on the Eddy-Current Effect

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PII: S0924-4247(17)31785-5  
DOI: <https://doi.org/10.1016/j.sna.2017.12.060>  
Reference: SNA 10547

To appear in: *Sensors and Actuators A*

Received date: 10-10-2017  
Revised date: 27-12-2017  
Accepted date: 27-12-2017

Please cite this article as: Wang H, Kow JW, Raske N, de Boer G, Ghajari M, Hewson R, Alazmani A, Culmer P, Robust and High-Performance Soft Inductive Tactile Sensors based on the Eddy-Current Effect, *Sensors and Actuators: A Physical* (2010), <https://doi.org/10.1016/j.sna.2017.12.060>

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# Robust and High-Performance Soft Inductive Tactile Sensors based on the Eddy-Current Effect

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## Highlights

- The first Soft Inductive Tactile Sensor (SITS) is proposed.
- Working principle and design methodology of SITS are discussed.
- A SITS prototype achieves a resolution of 0.82 mN in a range of over 15 N.
- The presented SITS can operate in water or other harsh environments.
- The SITS systems are low cost, durable, low hysteresis, and high performance.

## Abstract

Tactile sensors are essential for robotic systems to interact safely and effectively with the external world, they also play a vital role in some smart healthcare systems. Despite advances in areas including materials/composites, electronics and fabrication techniques, it remains challenging to develop low cost, high performance, durable, robust, soft tactile sensors for real-world applications. This paper presents the first Soft Inductive Tactile Sensor (SITS) which exploits an inductance-transducer mechanism based on the eddy-current effect. SITSs measure the inductance variation caused by changes in AC magnetic field coupling between

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