PHYSICAL SENSORS I (13:50 - 15:20)

Session Chair: Jonas H. Osório - UFLA, Brazil

13:50 - Passive interferometric fiber-optic gyroscope for aerospace applications

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Interferometric fiber optic gyroscopes (IFOG) are used in applications that require very low noise, high scale factor stability, and high sensitivity, such as navigating airplanes, submarines, and spacecraft. However, the traditional closed-loop IFOG requires integrated optics components and high-frequency synchronous modulation and demodulation, which highly increases the cost and complexity of the IFOG. In this work, it is proposed the use of a passive IFOG configuration for uses in aerospace applications. The passive IFOG does not require modulation and its dynamic range is limited by the sample rate used to digitize the signal.

14:05 - POF sensor for angle measurement in a textile-based soft hand exoskeleton

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Soft robotics hand exoskeletons have proven to be effective in recovering hand function due to features such as lightweight, portability, and comfort. These devices incorporate user interfaces to identify the intention of the user's movement to control the exoskeletons. However, the monitoring of the physical variables of the device is still limited. Some devices have included resistive and capacitive sensors for angle or grip force detection but increased the complexity of the systems. Research in optical sensors for robotic hands and prostheses presents an alternative to the development of sensors for soft robotics. This work presents the development and validation of an optic sensor for angle measurement of a textile-based hand exoskeleton. The results show that the optical fiber sensor is an option for an angle sensor for a soft hand exoskeleton by obtaining a correlation coefficient of 99% between the sensor and software data.