Sociedade Brasileira de AUTOMÁTICA

I Webinar 2022

31 de março de 2022 às 17h30.

Polymeric and Silica Fiber Optic Nanosensors, Theory and Applications

Canal do Youtube da SBA

Abstract: In recent years there has been a meteoric rise in the use of plastic optical fiber (POF) for short-length data transmission and for sensors. The reason for this is that POFs can be connected to transmission components at low cost and using simple tools leading to a decrease of POF costs as much as the peripheral components, making it possible the easy access to this technology. POF sensors are relatively new to optical fiber sensing and for this reason, it is important to promote and divulge this technology in this talk that discloses its advantages and capabilities in the research and industry. This presentation will also deal with Fiber Bragg Grating (FBG) sensors. FBGs can be found in many practical and industrial application and it will be shown our experience in applying FBG in many types of sensors for the electric energy industry. The presentation starts with the general theory of optical fiber sensors and their common technologies and then on FBG and POF sensors theory. The focus then goes to several practical applications of optical fiber sensors, for both plastic and silica fibers, including successful field applications designed by our laboratory in areas such as Oil & Gas, Biotechnology and Electrical Energy. The following topics are presented and discussed throughout the talk: Principles of Polymer and Silica Optical Fibers; Principles optical fiber sensors; Optical Fiber Sensors technologies; Temperature Sensing; Strain & Force Sensing; Refractive Index Sensing; High voltage switch monitoring; Current & Voltage Sensing; Gas Sensing; Biological Sensing; Oil Leakage Sensing; High voltage and high current measurements; Gas flow velocity measurements.

Biografia do palestrante:

MARCELO MARTINS WERNECK was born in Petrópolis, Rio de Janeiro, Brazil, and graduated in Electronic Engineering from the Pontifical Catholic University of Rio de Janeiro (PUC) in 1975. He obtained his MSc from the Biomedical Engineering Program at COPPE, Federal University of Rio de Janeiro (UFRJ) in 1977. In 1978 he joined the Department of Electronics and Computing at UFRJ where he is currently Full Professor. His PhD was obtained by the University of Sussex, UK, in 1985. He is currently coordinator of the Instrumentation and Photonics Laboratory of the Electrical Engineering Program at COPPE where he develops research in the field of optical fibers, instrumentation and transducers. His research is concentrated in the areas of Electrical and Photonic Engineering, working mainly in Electronic Instrumentation and Optical Fiber Sensors. He also develops research in nanophotonics and nanobiosensors at the Nanotechnology Engineering Program. Marcelo Werneck has a PQ-1 scholarship from CNPq and a Cientista de Nosso Estado by FAPERJ.

Marcelo Werneck is a reviewer of several journals, such as Analytica Chimica Acta, Biosensors and Bioelectronics, IEEE Sensors, IET-Generation, Transmission & Distribution, Journal of Lighwave Tecnology, Optics Express, IEEE Transactions on Instrumentation & Measurement, Sensors & Actuators, Optics and Laser Technology, among others.

Impact factors in June 2020: h-index = 19; Citations = 1233; Publications = 76; Readers = 770; Views = 11245, h10-index=34.

Apoio: *CT de Instrumentação da SBA*