

Dear readers:

COVID-19 has affected more than 280 million people, killing more than 5.4 million worldwide, since the first case reported of SARS-CoV-2 in Wuhan, China, in 2019, followed by its variants, such as the United Kingdom variant (B.1.1.7), the Brazilian variants (P.1, P.2 and N.9), the South Africa variant (B.1.325), and the recent variant Omicron (B.1.1.529), firstly detected in Africa. COVID-19 is still strongly affecting some countries, as is the case of Russia, with currently more than 1,000 deaths per day.

This thematic issue brings articles on multidisciplinary techniques of Engineering to fight COVID-19, addressing all its aspects, including source and detection technologies for the study, treatment, and prevention of COVID-19; biomedical sensor design and fabrication, performance, processing approaches, and applications; new developments and recent improvements in designs; and the electronics, data processing, and materials of biomedical sensors.

Five contributions have been accepted for this issue, which were reviewed through the corresponding editorial process conducted by experts in this field. The contributions published here correspond to thirty-three researchers from different countries (Brazil, Ecuador, El Salvador, and Peru).

The first work “Social Distancing in the Face of COVID-19: Simulation of the Maximum Capacity of People Through PHP” makes use of programming techniques, using the PHP language, for the development of a web application that simulates the maximum capacity of people who can enter a place in an internal or external area, complying with the social distancing of 2 m required in this time of COVID-19. The work “Design and Construction of Automated Mechanical Ventilation Equipment to Assist Respiratory Failure” presents the requirements for the design (using Computer Aided Design – CAD), construction and validation of a mechani-

cal ventilation system, to be used in patients with respiratory failure, mainly due to the COVID-19 pandemic, followed by measurements of the conditions of the supplied air conducted with the help of professionals dedicated to the maintenance of medical equipment and with the approval of internist doctors.

The following article, entitled “Characterization of Delux: Ultraviolet Light Sterilization Device for PFF2 / N95 Masks Against COVID-19”, presents a characterization of the sterilization device, called DELUX, utilizing UVC (Ultraviolet C light spectra), for sterilization of PFF2/N95 masks, allowing to extend the time of safe use of these masks in emergency conditions. The work addresses the fact of the world population is still forced to wear facemasks in public, as they continue being the most effective protocol to avoid and prevent COVID-19 spread. Thus, the article “Evaluation of AIoT Performance in Cloud and Edge Computational Models for Mask Detection”, describes an automatic facemask detection system, using concepts of Artificial Intelligence of Things (AIoT), to remind people the importance of wearing them appropriately. The system allows detecting correct, inappropriate, and non- facemask wearing, based on two computational models: Cloud and Edge.

Finally, the work entitled “Prototype of a Device for the Automatic Physiological Measurement to Assist the Diagnosis and Monitoring of patients with COVID-19” describes the design, construction and preliminary results of a device to automate the measurement of physiological signals (temperature, oxygen, pressure and heart rate) to assist in the diagnosis and monitoring of COVID-19. The system includes also a mobile application, which receives measurements data in real time and create a database for medical evaluation.

Enjoy all these works! We hope in 2022 to be free of this pandemic!

Teodiano Bastos-Filho, PhD
Associate Editor