

Call for Papers
IEEE Journal of Selected Topics in Signal Processing
Special Issue on Signal Analysis for Detection and Monitoring of Contagious Diseases

The outbreak of the COVID-19 infection triggered by the SARS-CoV-2 Corona virus is a recent example of the challenges that can arise facing contagious diseases. As a consequence, there is currently an unseen interest in solutions across scientific disciplines to help in the fight against contagious diseases. Signal processing and its combination with recent Artificial Intelligence (AI) solutions bears a huge potential in general to detect, analyze, monitor, and help in other ways in this context. In this respect, we call for signal processing solutions for contagious diseases such as viral or bacterial by digital and mobile health and further contributions. In many immediate use-cases, signal processing is already being applied or researched, such as in deep learning-based image analysis, or even audio-based tracking of symptoms. In this special issue, we aim to gather novel insights across signal types such as audio, speech, image, video, physiological, and more specific medical signals, as well as their multimodal combination for application in the detection and monitoring of contagious diseases. A focus is thereby put on AI-empowered processing of the signals, such as by suited and novel deep learning approaches, or other forms of machine learning and more general AI. In addition, factors of crucial practical relevance to assure working solutions in the real world are emphasized upon. Examples include robust, privacy-preserving, distributed, and “green” efficient, explainable, responsible, trustable, and usable solutions. While it may be a multi-year effort to develop intelligent systems as described above, a big contribution this special issue further aims to make besides technical papers, is the description of the creation and collection of datasets of all kinds related to COVID-19 and other contagious diseases. Such ideally publicly available datasets will facilitate further progress much needed by our societies around the globe. In light of the urgency triggered by contagious diseases, pre-publication on IEEE’s novel pre-print archive techRxiv (<https://www.techrxiv.org/>) is encouraged. The submission system for this issue opens one month before the submission due date.

Topics of interest include (but are not limited to):

- Signal processing for viral, bacterial, parasitic, or fungal contagious diseases
- Monomodal or multimodal signal processing solutions for contagious disease infection detection, risk assessment, and diagnosis (e.g., symptom recognition)
- Signal processing solutions for monitoring of contagious diseases’ spread, social distancing and countermeasures’ effects, treatment and recovery, and patient wellbeing
- Robustness for real-life application of signal processing for contagious disease use-cases
- Privacy-preserving, distributed, and “green” efficient solutions
- Explainable, responsible, trustable, and usable signal processing for contagious diseases
- Novel AI techniques for signal processing related to contagious diseases
- Databases and techniques for dealing with drifting target, little data, or big data signal processing in the context of contagious diseases

Important Dates:

Manuscript Submission Due:	30 May 2021 (submission system opens April 2021)
First Review Completed:	31 July 2021
Revised Manuscript Due:	15 September 2021
Second Review Completed:	31 October 2021
Final Manuscript Due:	15 December 2021

Guest Editors:

Björn W. Schuller (University of Augsburg, Germany)
Yonina C. Eldar (Weizmann Institute of Science, Israel)
Maja Pantic (Imperial College London, UK)
Shrikanth Narayanan (University of Southern California, USA)
Tuomas Virtanen (Tampere University, Finland)
Jianhua Tao (Chinese Academy of Sciences, China)