

Tentative Outline

Special Thematic Issue for the journal *CURRENT MEDICAL IMAGING*

Title of Thematic Issue: FROM NANOSCALE TO HYPERSPECTRAL IMAGING - HOW TO GATHER AND UNDERSTAND MEDICAL IMAGES HARVESTED IN EXTREMELY DIFFICULT SITUATIONS

**Guest Editor: Vania V. Estrela
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Shoulin Yin**

- **Scope of the Thematic Issue:**

Keywords: Multiresolution, Super-resolution, Image Fusion, Denoising, Hyperspectral Imaging

Presently, the stability and reproducibility of biomedical image detection are still deficient due to the instability and variability of biologically active units. These barriers will inevitably change with the rapid development of biology, informatics, medicine, materials science, and microelectronics. New expensive and hard-to-operate technologies and practices for the current state of affairs will open new roads to progressively more non-invasive medical imaging.

Smart integration of medical imaging with data storage, decision-making, communication, self-check, self-calibration, self-compensation, numerical processing, and other functions, increasing the portability and interchangeability of subsystems. Artificial Intelligence (AI) technology automatically will analyze data collected by the sensor and provide more accurate

The data fusion methods can expand measurement performance by integrating electrical, magnetic, acoustic, thermal, force, and other multi-physical field measurements. Redundant data from multiple sensors improve the system's robustness, performance, and stability.

Currently, sensing technology has advanced considerably based on soft materials, electronics, and nanotechnology, to name a few items. The combination of several sensors and associated technology has enhanced online and real-time monitoring for daily autonomous measurements, diagnosing diseases and monitoring health quality in quotidian life.

Hardware advancements can provide reasonable explanations for some electromagnetic biological effects. New less-invasive research should focus on reflecting biological issues from mathematics, physics, chemistry, and life sciences to achieve a significant breakthrough in the study of biological electromagnetic mechanisms. These results help extend the application range of electromagnetic imaging detection. Evermore parameter information can result from measured signals. More importantly, the study of detection mechanisms and algorithms also contributes to improving sensor sensitivity and stability.

The cyber-physical system paradigm can advance and consolidate networks and detection systems linking distributed sensor nodes and fusion centers through communication networks with flexibility, scalability, less wiring, low cost, easy expansion, and more straightforward maintenance. Biosensors integrate wireless transmitters, automatically conveying the collected data to the server and displaying it on terminals in real-time.

Sub-topics:

The sub-topics to be covered within the issue should be **tissue analysis, histopathology, organ analysis,**

microscopy, nanotechnology medical imaging, human electromagnetic field imaging, human biofield, nuclear medical imaging, ultrasound, 4D imaging, flow movement.

Tentative titles of the articles and list of contributors:

Advances in Non-Invasive Human Imaging

Ricardo Tadeu Lopes, LIN-COPPE, Federal University of Rio de Janeiro, RJ, Brazil

New Frontiers in Super-Resolution Medical Images

Hui He, Harbin Institute of Technology, China

Nuclear Medicine: Current Caveats and What Lies Ahead

Joaquim Teixeira de Assis, IPRJ-State University of Rio de Janeiro, RJ, Brazil

Non-Invasive Blood Exams

Joao Manuel R.S. Tavares, University of Porto, Portugal

Hyperspectral Medical Imaging: Still Images Prospects

Roberto Sabatini, RMIT, Melbourne, Australia

Hyperspectral Medical Imaging: Video Advances

Rogério Atem de Carvalho, Instituto Federal de Educação, Ciência e Tecnologia Fluminense (IFF), Brazil

Nanorobotic Imaging in Medicine

Asiya Khan, University of Plymouth, Plymouth, United Kingdom

New Frontiers in Multiresolution Sensor Fusion for Medical Imaging

Robert Sroufe, Duquesne University, Pittsburgh, United States

Schedule:

Manuscript submission deadline: November 30, 2021

Announcement of acceptance by the Guest Editors: December 31, 2021

Final manuscripts due: January 31, 2022

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