

# ***Intersection between Image Processing and Machine Learning in Biomedical Applications***

*Thematic Session within VipIMAGE 2019*

*VII ECCOMAS Thematic Conference on Computational Vision and Medical Image Processing*

*Porto, Portugal, 16-18 October 2019*

[www.fe.up.pt/vipimage](http://www.fe.up.pt/vipimage)

[web.fe.up.pt/~vipimage/nav/conference/sessions.htm](http://web.fe.up.pt/~vipimage/nav/conference/sessions.htm)

## **Description**

Image Processing and Machine Learning techniques play a fundamental role in the analysis of biomedical data. Computer Aided Detection and Diagnosis tools have the potential to greatly improve several health-related pipelines. These types of tools are often based on Image Processing and Machine Learning techniques. Traditionally, the pipelines are composed of some initial Image Processing steps, followed by a final Machine Learning block that performs a decision. With the advent of Deep Learning, and, for images in particular, Convolutional Neural Networks, several questions arise. Some of them include: Is there a relationship between “old school” techniques and deep ones (e.g. between Gabor Filters and the Filters extracted with Convolutional Neural Networks)? Are traditional image processing pipelines outdated or should they be used in combination with more recent techniques? In terms of interpretability, would health staff be more comfortable with the traditional methods? Are there available sufficiently good explanatory methods to help explain the algorithm to health workers? This thematic session will provide an opportunity to the bioengineering and biomedical community to exchange knowledge and information on the latest advances and challenges in the relationships, and complementarity of Image Processing and Machine Learning methods. We hope to bring together researchers who are interested in the general fields of Image Processing and Machine Learning, especially in its applications to biomedical areas.

## **Topics of interest include (but are not restricted to):**

- Image classification
- Computer vision and visualization
- Image processing for biomedical applications
- Pipelines with image processing and machine learning blocks
- Illustration of relationships between image processing techniques and machine learning algorithms
- Theoretical demonstrations of relationships between image processing techniques and machine learning algorithms

## **Publications**

The **proceedings book** will be **published by Springer** under the book series [\*\*"Lecture Notes in\*\*](#)

**Computational Vision and Biomechanics** and indexed by Elsevier Scopus.

A special issue of the Taylor & Francis international journal "**Computer Methods in Biomechanics and Biomedical Engineering: Imaging & Visualization**", indexed in Clarivate Analytics Emerging Sources, Elsevier Scopus and dblp, **will be published**. All authors of works presented in VipIMAGE 2019 will be invited to submit an extended version to the special issue.

### **Important dates**

- **Submission of extended abstracts: May 31, 2019** (final deadline)
- Final Papers (non-mandatory): July 15, 2019

### **Organizers**

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