Image Analysis and Machine Learning for Skin Ulcers

Thematic Session within VipIMAGE 2017

VI ECCOMAS Thematic Conference on Computational Vision and Medical Image Processing

Porto, Portugal, 18-20 October 2017

www.fe.up.pt/vipimage

web.fe.up.pt/~vipimage/nav/conference/sessions.htm

Description

In humans, skin is the largest organ: about 2 square meters and 2 to 3 kg (7% of the total weight). As interface with the environment, skin plays an important immunity role in protecting the body against pathogens and excessive water loss. Its other vital functions are insulation, temperature regulation, sensation, or synthesis of vitamin D. Skin diseases are some of the most common human illnesses across geographies and time: eczema, psoriasis, acne vulgaris, pruritus, decubitus ulcer, impetigo, abscess and other bacterial skin diseases. Three skin conditions are in the top ten most prevalent diseases worldwide [1], and eight fall into the top 50. When considered collectively, skin conditions range from being the second to the 11th leading causes of years lived with disability at the country level. Long and impaired healing of chronic ulcers (e.g., diabetic, bacterial or viral infections) penalizes patients' quality of life and highly burdens the cost of healthcare systems since there are very common in the elderly. More and more cares are taken at home with nurses not specialized in dermatology which implies to develop monitoring techniques by telemedicine. On the other hand, for under-served areas such as tropical areas where there is a blatant lack of physicians, in particular specialized in dermatology, there is also a need to develop efficient computer-aided-diagnosis and telemedicine tools based on portable imaging devices and/or corresponding computational algorithms [2]. Despite many technological advances in skin imaging, the healing assessment is still too often based on non-quantitative visual evaluation.

This thematic session aims to bring together scientist working in image processing and machine learning to share knowledge and discuss current and future challenges for developing efficient computer-aided-diagnosis and tele-dermatology. To improve the diagnosis and follow up of treatment, the session will specifically focus on new imaging techniques that can provide useful information (morphology, tissues and subcutaneous features) mixing with machine learning to identify the main types of skin ulcers and assess the effectiveness of treatment.

[1] Nicole E Johns, & al. A systematic analysis of the global burden of skin disease: lesions learned, The Lancet, 381, 2013.

[2] IMPULSO (Image Processing of Skin Ulcers in Tropical Areas) funded by STIC-AmSud regional program http://www.sticmathamsud.org/fr/stic/convocatoria-stic/

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

- Image processing and analysis of skin ulcers images
- Machine learning in skin ulcers analysis
- Computer-aided diagnosis and follow-up of skin diseases
- Light-tissue interaction models for cutaneous ulcer analysis

- New imaging approaches in dermatology (OCT, US, hyperspectral, …)
- Tele-dermatology with mobile phone or handheld cameras

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 ISI Thomson Reuters, Elsevier Scopus and dblp, **will be published**. All authors of works presented in VipIMAGE 2017 will be invited to submit an extended version to the special issue.

Important dates

• **Submission of extended abstracts: April 21, 2017 (FINAL deadline)**

• Authors Notification: May 10, 2017

• Final Papers (not compulsive): June 15, 2017

Organizers

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