

Global Wound Care Congress

September 12-13, 2016 San Antonio, USA

AUTOMATIC SEGMENTATION OF LOWER EXTREMITY ULCERS USING NEAR-INFRARED OPTICAL IMAGING

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Lower extremity ulcers are one of the most common complications in diabetes patients. Clinical studies have shown that reduction in wound size of < 40% within 4 weeks is an acceptable progress of the healing process. To date, visual inspection is usually adopted to monitor the wound healing process and wound size is measured from the surface of the images. A Near-Infrared (NIR) optical imaging approach has been developed to internally inspect the wound by non-contact imaging to differentiate the healing of the non-healing wounds. Herein, an automated image segmentation method was used for the first time to quantitatively measure the wound size from NIR and white light images. NIR wound segmentation was carried out on multiple venous leg ulcers and diabetic foot ulcers (FIU-IRB approved study). Upon applying graph cuts segmentation algorithm, the wound shape demarcated from NIR images closely matches the white light images (but not completely). This revealed that the NIR images are possibly providing tissue oxygenation information from the internal of the wound and not the surface of the wound. Our ongoing efforts are to co-register the white light and NIR images for comparison of the wound demarcated regions and quantification of the wound area.

Biography

Anuradha Godavarty received a Ph.D. in chemical engineering from Texas A&M University, Texas and worked as a Post-Doctoral Associate in the Department of Computer Science, University of Vermont, Burlington. She started as an Assistant Professor in the Department of Biomedical Engineering at Florida International University, Miami, Florida since 2004. Currently, she is a tenured Associate Professor in the Department of Biomedical Engineering at Florida International University. Her research interests are in developing near infrared optical imaging technologies and applying them for breast cancer imaging, functional brain mapping and wound care monitoring.

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