Real time vein visualization using near-infrared imaging

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ABSTRACT

Vein visualization is one of the most researched biomedical technique. Although the concept behind the technique is not complicated, the vein pattern acquisition method and the design and implementation of image processing algorithms become challenging. Nowadays, the major challenge faced by the medical practitioners is the difficulty in accessing subcutaneous veins for intra-venous injections due to various factors like low visibility of vein by naked eyes and patients with too narrow veins. Failure during venipuncture may lead to several problems like bruises, bleeding and rashes. Therefore, the real time vein visualization system is developed accordance with the objective of visualizing subcutaneous veins which is to assist medical practitioners by providing them visual guidance during venipuncture process. This system is developed based on near-infrared imaging and is connected to the monitor screen. The development stage includes edge detection, vein segmentation and vein visualization. Evolutionary prototyping method is used to develop the system and to ensure the quality of the final system through a few prototype refinement cycles. OpenCV library is also used for its real-time functionalities. The functionality of the system is evaluated through a series of planned system tests. The experimental results show that the proposed system is able to show the veins pattern.

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