



“The objectives of this study were to develop a low-cost NIR spectroscopy prototype from a standard mobile device, to evaluate its efficacy and acceptance as an educational tool, and in a clinical setting” Juric and Zalik (2014).

Reference:

Juric, S. and Zalik, B. (2014) An innovative approach to near-infrared spectroscopy using a standard mobile device and its clinical application in the real-time visualization of peripheral veins. BMC Medical Informatics and Decision Making. .

Real-time peripheral vein visualisation with a standard mobile device [@ivteam #ivteam](http://ctt.ec/Vj7g4+)

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Abstract:

Background: Excessive venipunctures are a significant problem both in emergency rooms and during hospital stays. Near-infrared (NIR) illumination devices improve venipuncture success rate but their usage is limited by their availability and economic cost. The objectives of this study were to develop a low-cost NIR spectroscopy prototype from a standard mobile device, to evaluate its efficacy and acceptance as an educational tool, and in a clinical setting.

Methods: Through a user-centric design process a prototype device was developed. Its educational efficacy was evaluated through a non-invasive, observational study (20 student clinicians, 25 subjects) and its acceptance was assessed using quantitative and qualitative analysis. A smaller clinical trial was performed by a group of 4 medical professionals over a period of 6 weeks that involved 64 patients.

Results: The prototype enables real-time visualization of peripheral veins on a variety of Android-based devices. The prototype was 35.2% more successful in visualizing and locating veins ($n_i=500$ attempts) than the nursing students. The acceptance assessment revealed high perception of usefulness, satisfaction, and ease of use. In the clinical trial, 1.6 (SD 1.3) additional veins per patient were identified compared with the traditional visualization methods.

Conclusions: To the best of our knowledge this is the first study that describes the design, feasibility and application of an NIR spectroscopy prototype developed on a standard mobile device.

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