

**This paper presents a portable imaging device designed to detect peripheral blood vessels for cannula insertion that are otherwise difficult to visualize beneath the skin” Chen et al (2016).**

Abstract:

This paper presents a portable imaging device designed to detect peripheral blood vessels for cannula insertion that are otherwise difficult to visualize beneath the skin. The device combines near infrared stereo vision, ultrasound, and real-time image analysis to map the 3D structure of subcutaneous vessels. We show that the device can identify adult forearm vessels and be used to guide manual insertions in tissue phantoms with increased first-stick accuracy compared to unassisted cannulation. We also demonstrate that the system may be coupled with a robotic manipulator to perform automated, image-guided venipuncture.

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Reference:

Chen, A.I., Balter, M.L., Maguire, T.J. and Yarmush, M.L. (2016) 3D Near Infrared and Ultrasound Imaging of Peripheral Blood Vessels for Real-Time Localization and Needle Guidance. *Medical Image Computing and Computer-Assisted Intervention*. 9902, p.388-396.

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