# MOBILE IMAGE OVERLAY SYSTEM (MIOS) FOR IMAGE GUIDED INTERVENTIONS

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BACKGROUND: Previously, a static image overlay system has been proposed for aiding needle placement interventions [1]. This system provides accurate transverse image guidance for musculoskeletal interventions [2]. Few limitations include requiring careful calibration, prone to misalignments and limited workspace. To overcome those limitations, we propose the MIOS.

METHODS: MIOS consists of mobile mirror-monitor configuration equipped with optical markers to register the pose of image overlay plane w.r.t patient and scanned image volume using the tracker device. Software will display the correct image in real time corresponding to the position of the device tracked. The needle trajectory is drawn on the image slice, which gets updated in the image overlay plane.

RESULTS: The initial design concept, simulation of intended clinical applications and specifications of MIOS were developed. The first prototype demonstrated the proof of concept.

DISCUSSION: Based on successful pre-clinical testing of the previous system, the MIOS promises to become a useful tool for image-guided interventions, such as musculoskeletal needle injections, parathyroidectomy, percutaneous nephrolithotomy and percutaneous access to blood vessels.

[1] Fichtinger *et al*., IEEE TBME, 52(8), 2005.

[2] Fritz *et al*., European Radiology, 23, 2013.