



Evaluating Optical See-Through Head-Mounted Display Calibration via Frustum Visualization

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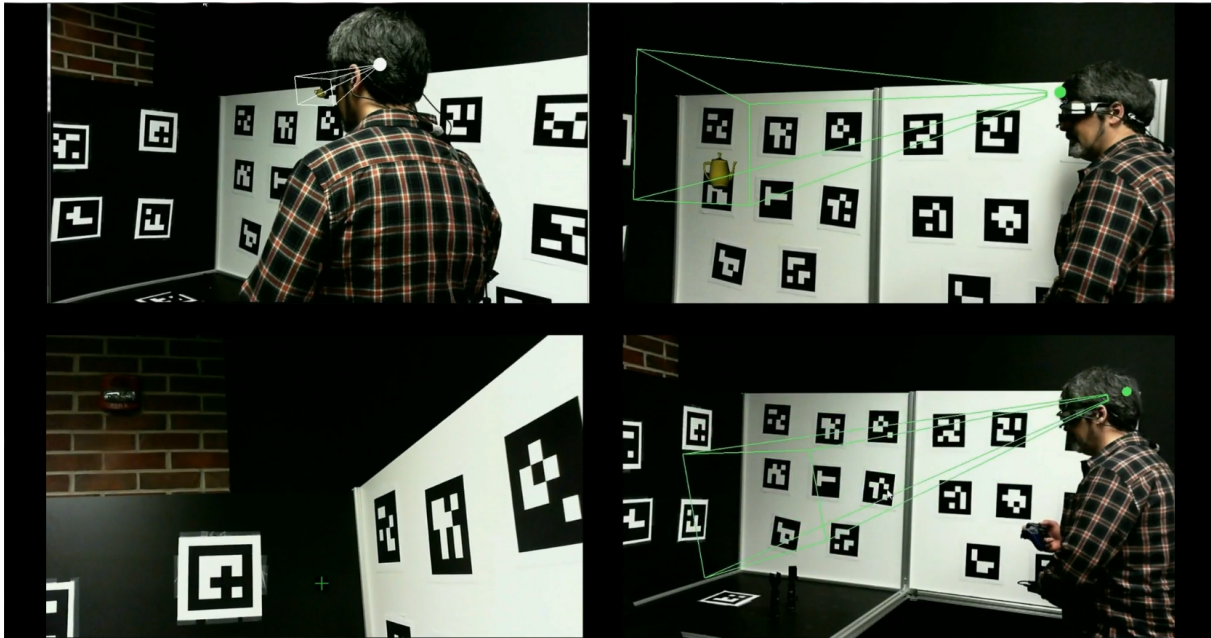


Figure 1: Frustum visualization of a SPAAM calibration. (Top) Visualizations of a user's SPAAM results with on-screen geometry overlaid onto the far plane of the viewing frustum. (Bottom) Images of a user performing screen-world alignments during SPAAM calibration.

ABSTRACT

Effectively evaluating optical see-through (OST) head-mounted display (HMD) calibration is problematic and largely relies on feedback from the user. Studies evaluating OST HMD calibration, such as those by McGarrity, Tang, and Navab et al. [2, 3, 1], utilize user interaction methods, such as touch pads, to facilitate on-line evaluation and correction of calibration results. In all of these studies, however, only the users themselves receive any visual feedback related to the calibration quality or the corrective actions taken to improve it. In this video, we present the use of standard frustum visualization to provide calibration quality information to the researcher in real time. We use a standard Single Point Active Alignment Method (SPAAM) calibration, [4], after which both the eye location estimate and resulting intrinsic values are displayed superimposed onto the user. Presenting the eye position relative to the user's head benefits studies on system error sources, and rendering on-screen visuals also allows outside observers to identify calibration issues and offer corrective suggestions. We believe that techniques, such as frustum visualization, will expand the amount

of information available for evaluating calibration results, and will greatly aid those investigating new and improved calibration procedures.

Keywords: Calibration, OST HMD, Frustum Visualization

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