Poster: Design and evaluation of a clinician-centred intelligent interface for echocardiographic image quality feedback.

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Abstract

Echocardiography is a widely used, non-invasive imaging technique for cardiac assessment, but its effectiveness is highly dependent on the operator's expertise. Variability in image acquisition can compromise diagnostic accuracy, highlighting the need for consistent, real-time feedback to support clinicians during scanning. Although recent advances in artificial intelligence have enabled automated assessment of image quality, these tools often fail to deliver feedback in a format that is interpretable, actionable, and seamlessly integrated into clinical workflows. This study presents the design and evaluation of a clinician-centred interface that provides visual feedback on image quality during echocardiographic examinations. The interface overlays quality assessments onto the imaging screen using intuitive visual elements, guiding the operator to improve the visibility of key cardiac structures such as the left ventricle, mitral valve, and endocardial borders, while also addressing image foreshortening. The system was developed through a human-centred design process involving clinician input, ethical safeguards, and iterative prototyping.

A three-phase evaluation involving peer reviewers, expert cardiologists, and clinical practitioners assessed usability and interpretability through qualitative feedback and structured usability metrics. Results confirmed the interface's effectiveness in enhancing user experience, supporting clinical decision-making, and preserving clinician autonomy.

The findings demonstrate the potential of this approach to improve consistency and confidence in echocardiographic image acquisition.

Keywords

Intelligent interface, echocardiographic image quality