

# New literature for real-time AI-empowered echochardiography

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## 1 Introduction

In the last decades the use of Echochardiography is crucial in Intensive Care Units (ICU) advances of smaller US clinical devices, US image quality and functions and its real-time capabilities to access cardiac anatomy and functions [3, 8, 7, 1]. However, despite the previous advances there is still challenges on finding standard views from experienced sonographehrs that sometimes such quantifications are qualitative and subjective [3].

Assessing left ventricular ejection fraction (LVEF) is done at the point of care by clinicians with different expertise which is impacted on the rhythm and structural varations [6]. However, automatic quantification of LVEF is still challenging at the point of care due to variation of protocols, skills levels [4] and the nature of proving feedback on real-time [6].

## 2 Methods and materials

Rank-2 non-negative matrix factorization [9] and recently Robust Non-negative Matrix Factorization [2] are low-computation cost algorithms to automatic segment mitral valve. Clustering techniques [10] [5]. Laumer et al. proposed a novel autoencoder-based framework to learn human interpretable representation of cardiac cycles from cardiac ultrasound data [? ],

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