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RVENet: A Large Echocardiographic Dataset for the Deep Learning-Based Assessment of Right Ventricular Function

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Abstract

Right ventricular ejection fraction (RVEF) is an important indicator of cardiac function and has a well-established prognostic value. In scenarios where imaging modalities capable of directly assessing RVEF are unavailable, deep learning (DL) might be used to infer RVEF from alternative modalities, such as two-dimensional echocardiography. For the implementation of such solutions, publicly available, dedicated datasets are pivotal.

Accordingly, we introduce the RVENet dataset comprising 3,583 two-dimensional apical four-chamber view echocardiographic videos of 831 patients. The ground truth RVEF values were calculated by medical experts using three-dimensional echocardiography. We also implemented benchmark DL models for two tasks: (i) the classification of RVEF as normal or reduced and (ii) the prediction of the exact RVEF values. In the classification task, the DL models were able to surpass the medical experts' performance. We hope that the publication of this dataset may foster innovations targeting the accurate diagnosis of RV dysfunction.

Keywords

Echocardiography

Right ventricle

Right ventricular ejection fraction

Deep learning

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