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"EchoCV": A Web-Based Fully Automated Echocardiogram Interpretation System

Tech ID: 29547 / UC Case 2018-046-0

INVENTION NOVELTY

Echo-CV is a novel, fully-automated system for analyzing images obtained from an echocardiogram that can be deployed on the web.

VALUE PROPOSITION

Echocardiography is one of the most widely used diagnostic tests in cardiology. It is routinely used in the diagnosis of heart diseases including Atherosclerosis, Amyloidosis, Aneurysm, Cardiomyopathy, Congenital heart disease, Heart failure, Left ventricular hypertrophy, Pericarditis and Valvular heart disease. It can provide a wealth of information to the physicians including the size and shape of the heart, pumping capacity, location and extent of any tissue damage, cardiac function tests including the cardiac output, ejection fraction and diastolic function.

Traditionally, echocardiograms are interpreted by cardiologists. Automated echocardiogram interpretation system has the potential to transform clinical practice in multiple ways including enabling low-cost serial assessment of cardiac function by non-experts in primary care and rural settings for targeted disease detection. It can significantly streamline the process to facilitate quantification of cardiac function in clinical trial settings as well as in hospitals. This technology fulfills an unmet need of the cardiac disease diagnosis industry, physicians and patients alike.

ADVANTAGES OF THE TECHNOLOGY:

▷ Fully automated web-based software platform.

▷ Compatible with readily available hardware.

▷ Model tested on Cardiomyopathy and Cardiac Amyloidosis patients.

▷ Statistically significant agreement between manual and automated measurements.

TECHNOLOGY DESCRIPTION

Researchers at University of California, San Francisco have developed a software platform for automated analysis of echocardiograms that require no user intervention and thus can be deployed on high-performance computing cluster or web application. The echo video is preprocessed by automatically extracting metadata, convolutional neural networks are used for identifying views as well as image segmentation to calculate various structural and functional parameters for focused disease

INVENTORS

▷ Deo, Rahul

▷ Zhang, Jeffrey

OTHER INFORMATION

KEYWORDS

Software code, Echocardiogram interpretation, Cardiac disease diagnosis

CATEGORIZED AS

▷ **Biotechnology**

  ▷ Bioinformatics

  ▷ Health

▷ **Computer**

  ▷ Software

RELATED CASES

2018-046-0

diagnosis.

LOOKING FOR PARTNERS

To develop & commercialize the technology for expanding cardiac disease diagnosis using the automated echocardiogram interpretation platform.

STAGE OF DEVELOPMENT

Proof of Concept

RELATED MATERIALS

▶ Zhang, J., Gajjala, S., Agrawal, P., Tison, G.H., Hallock, L.A., Beussink-Nelson, L., Fan, E., Aras, M.A., Jordan, C., Fleischmann, K.E., Melisko, M., Qasim, A., Efros, A., Shah, S.J., Bajcsy, R., & Deo, R.C. (2017). A Web-Deployed Computer Vision Pipeline for Automated Determination of Cardiac Structure and Function and Detection of Disease by Two-Dimensional Echocardiography.

DATA AVAILABILITY

Proof of Principle

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	11950961	04/09/2024	2018-046