


# hAloThon-2021

DEPARTMENT OF COMPUTER  
SCIENCE  
&  
ENGINEERING

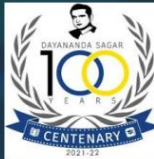
**WELCOME YOU ALL**

**FOR 48 hrs HACKTHON**





DAYANANDA SAGAR COLLEGE OF ENGINEERING  
(Autonomous Institution Affiliated to VTU, Belgaum)  
Shavige Malleshwara Hills, Kumarswamy Layout, Bangalore -560078.)



DAYANANDA SAGAR  
100  
CENTENARY  
2021-22

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

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## hAloThon-2021


Hackathon on AI and IoT


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Sponsored by HeARThHealth Tech

### AI Guided Ultrasound Image Acquisition with Improved Quality

Nov 19, 2021, 12:15 PM  
Join Zoom Meeting :  
<https://us02web.zoom.us/j/6180264830>  
Meeting ID: 618 026 4830





Online Hackathon

Nov 19 : Introduction + Problem Statement + Registrations

Nov 22: Registration Closes + Data set release

Nov 25 & 26 : Hackathon

Nov 30 : Prize Distribution

Prof. Dhara K N  
Prof. Bhavana B R  
Coordinators  
CSE, DSCE

Dr. Arbind Gupta  
Dr. Vindhya M  
Professor  
CSE, DSCE

Dr. Ramesh Babu D R  
Vice Principal & HOD  
CSE, DSCE

Dr C P S Prakash  
Principal  
DSCE

Dayananda Sagar Institutions

Department of Computer Science & Engineering, DSCE

**Team : B**

**Team Name : OPQUAD**

**Team members: Oindrila Banerjee 1DS18CS085**

**P Charith 1DS18CS086**

**Pavan K 1DS18CS087**

**Piyush Goyal 1DS18C090**

**Prajwal Kumar 1DS18CS092**



# Problem Statement 1

**Detection of blood chambers in all frames of an echo video, given the contour of the chamber in the first frame.**

- An echo of heart is a video consisting of multiple frames of a beating heart. The video shows one full cycle of a beating heart from diastole (fully expanded) to systole (fully contracted) to diastole again.
- The heart has four chambers but only 2, 3 or 4 chambers may be visible in one video. We want to identify one of the chambers automatically.
- The boundary (contour) of the chamber in the first frame is given. The boundary lies at the point of maximum intensity change (perpendicular to the boundary) around the chamber.
- As the heart expands and contracts, the boundary also should grow and shrink so that points on the contour lie at the point of maximum intensity change. It should also maintain smoothness of the boundary (it should not be zig-zag).
- The problem is to adjust the boundary, given in the first frame, for all subsequent frames in the video by satisfying the criteria given above.
- The expected result is to show the video with the frames superimposed in all the frames.



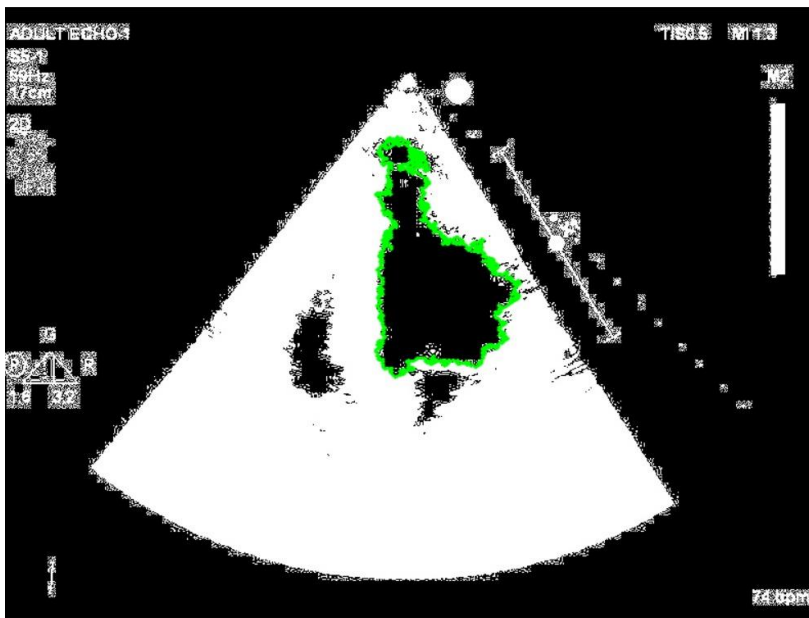
**Design:** 1. Result with Screenshot

- 1. Image processing**
- 2. Based on largest Area**
- 3. Based on Centroid of the given first frame contour coordinates and largest area**
- 4. DeepGaze**

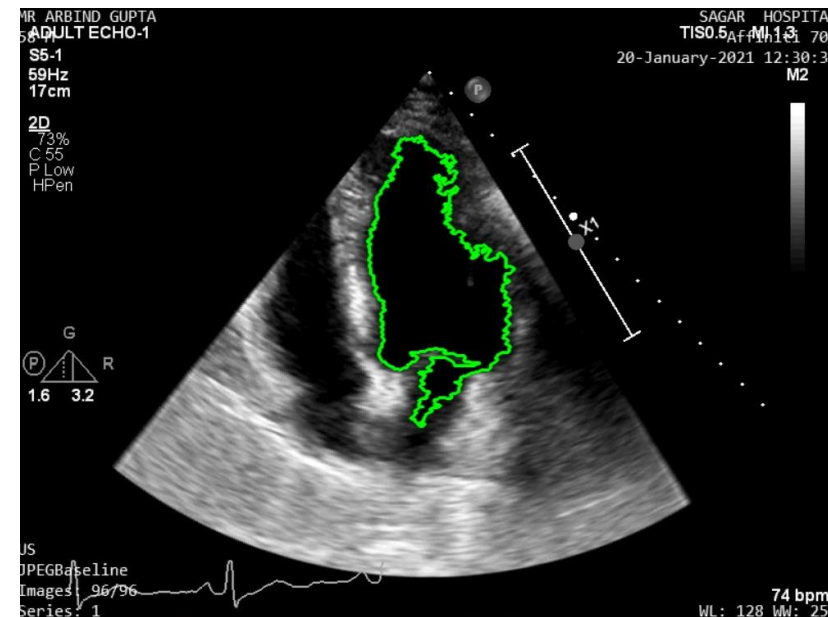




# Based on Area:



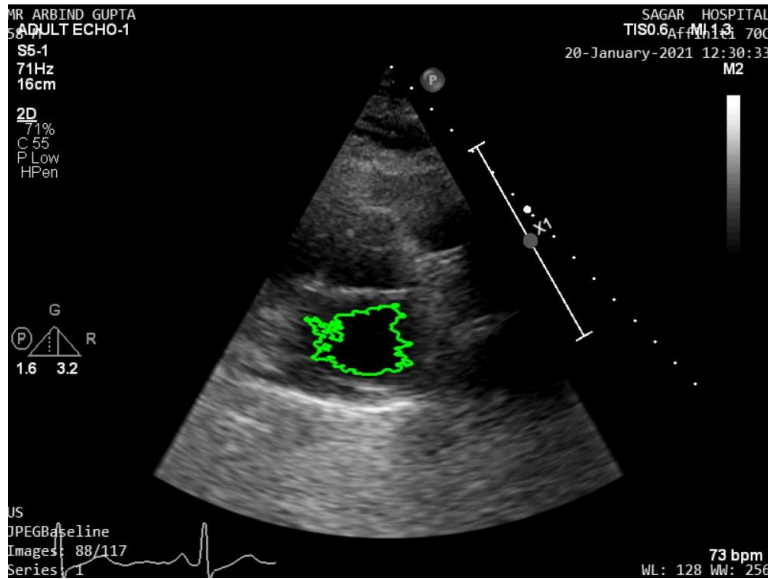
Threshold Image



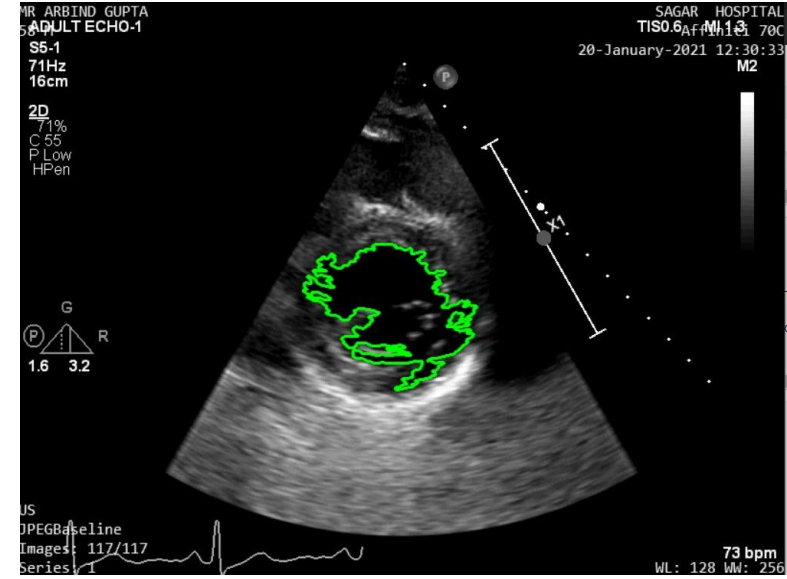
Output Image



# Based on Centroid and Area:



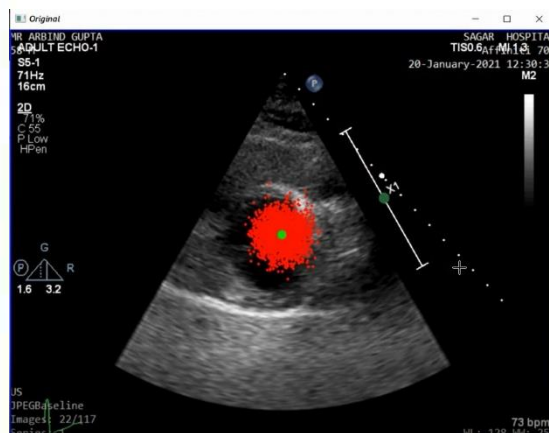
IM\_003



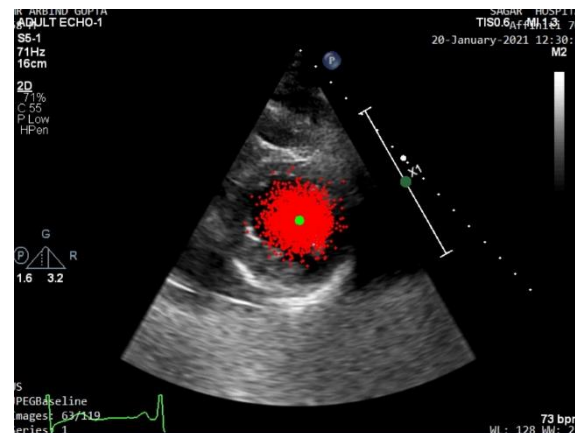
IM\_003



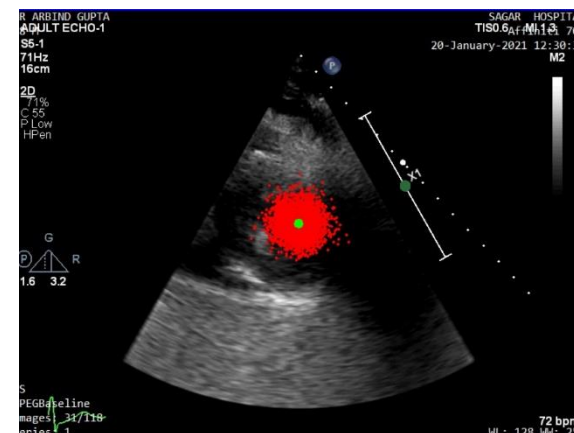
# DeepGaze:



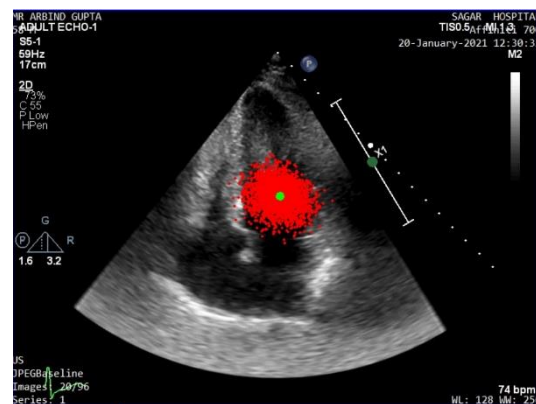
IM\_003



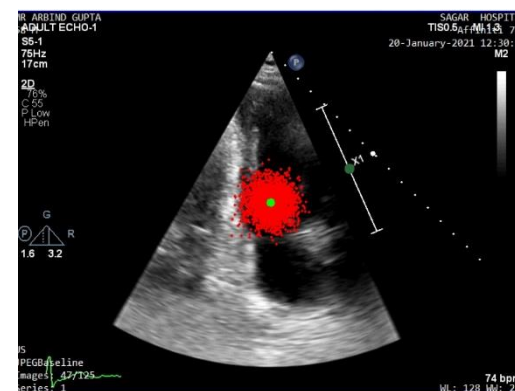
IM\_004



IM\_005



IM\_008



IM\_0013



## 2. Improvement and Future direction

- The image segmentation model can be used to find the other chambers in the heart.
- We can implement Image Segmentation with Distance Transform and Watershed Algorithm.
- Also EcoNet can be implemented which provides significant results.
- Different kinds of filter such as Gaussian filter, Mean Filter, Morphological transformation, etc. can be applied to smoothen the contour plot.

