



Cardiac MRI Segmentation:

- Label propagation using Image Registration
- Multi-view post-processing

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LABEL PROPAGATION USING IMAGE REGISTRATION

Using Image Registration techniques to generate synthetic labels to use those labels along with the annotations from the clinicians to allow our models to perform well over under-represented scanners, pathologies, etc.

Image Registration

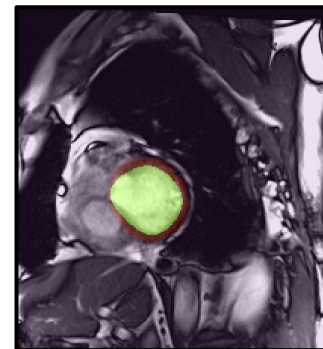
A network (VoxelMorph) learns how to calculate the deformation field between End Diastolic and End Systolic time-frames and the rest of times.

Label Propagation

We extended the annotated dataset by applying the deformation fields over the annotations and use them as weak labels for the unannotated times.

Training Model

Then trained a simple U-Net with the new dataset and analysed the result over the different scanners and tissues.



	Regions			Vendors				Total
	LV	Myo	RV	A	B	C	D	Dice
Baseline (M&Ms)	0.475	0.386	0.394	0.553	0.583	0.419	0.277	0.418
Proposed (M&Ms)	0.504	0.430	0.398	0.548	0.573	0.443	0.338	0.444

MULTI-VIEW POST-PROCESSING

By using predicted annotations over two different views (Short Axis and Long Axis) in cardiac MRI, we are exploring an iterative process where corrections are made in one view by using the prediction in the other one.

- (1) Applying the affine transformation using the data included in the recordings we are able to map one image on top of the other.
- (2) Then, we use a soft composite prediction and fuse the imported segmentation by voting over the existing one.
- (3) Lastly, we plan to condition both networks (SA and LA) with their annotation iteratively.

