

Results

Resnet18

2-stream resnet model for our classification problem

Legend:

- Conv1: s=3, p=2, k=7, f=64
- Max pool: s=1, p=1, k=3
- Conv2: s=1, p=1, k=3, f=64

Resnet Connection: s=1, p=0, k=1, f will be same as the next kernel

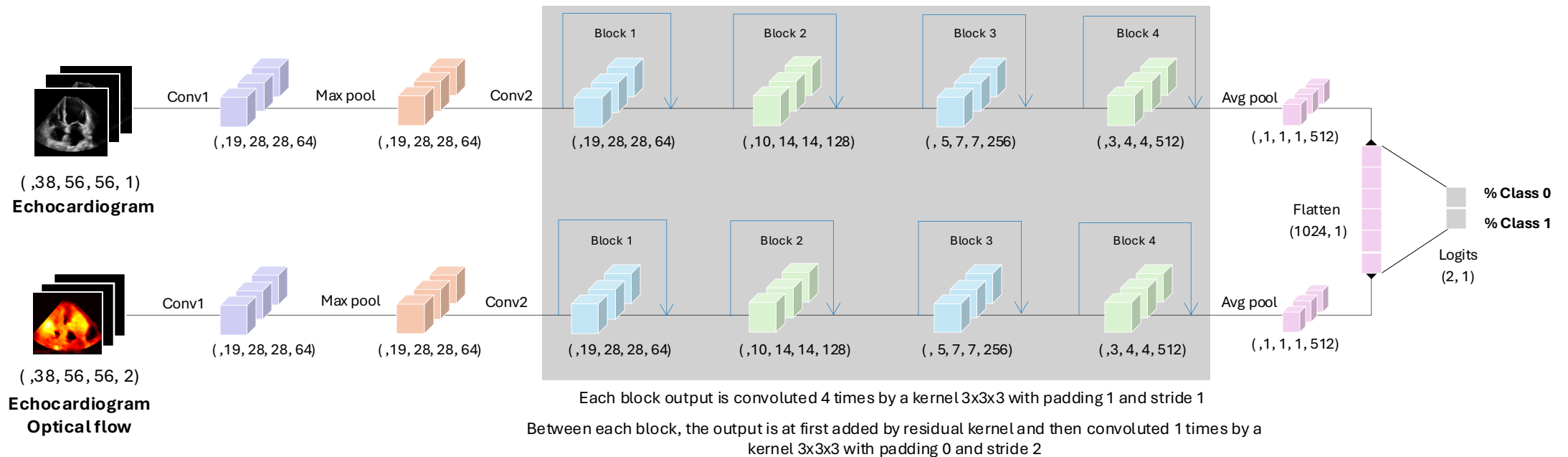
- Block1: s=1, p=1, k=3, f=64
- Block2: s=1, p=1, k=3, f=128
- Block3: s=1, p=1, k=3, f=256
- Block4: s=1, p=1, k=3, f=512

- OBS: After every convolution, the output will pass through batch normalization, then activation function ReLU.

- Between Block1, Block2: s=2, p=0, k=1, f=128
- Between Block2, Block3: s=2, p=0, k=1, f=256
- Between Block3, Block4: s=2, p=0, k=1, f=512

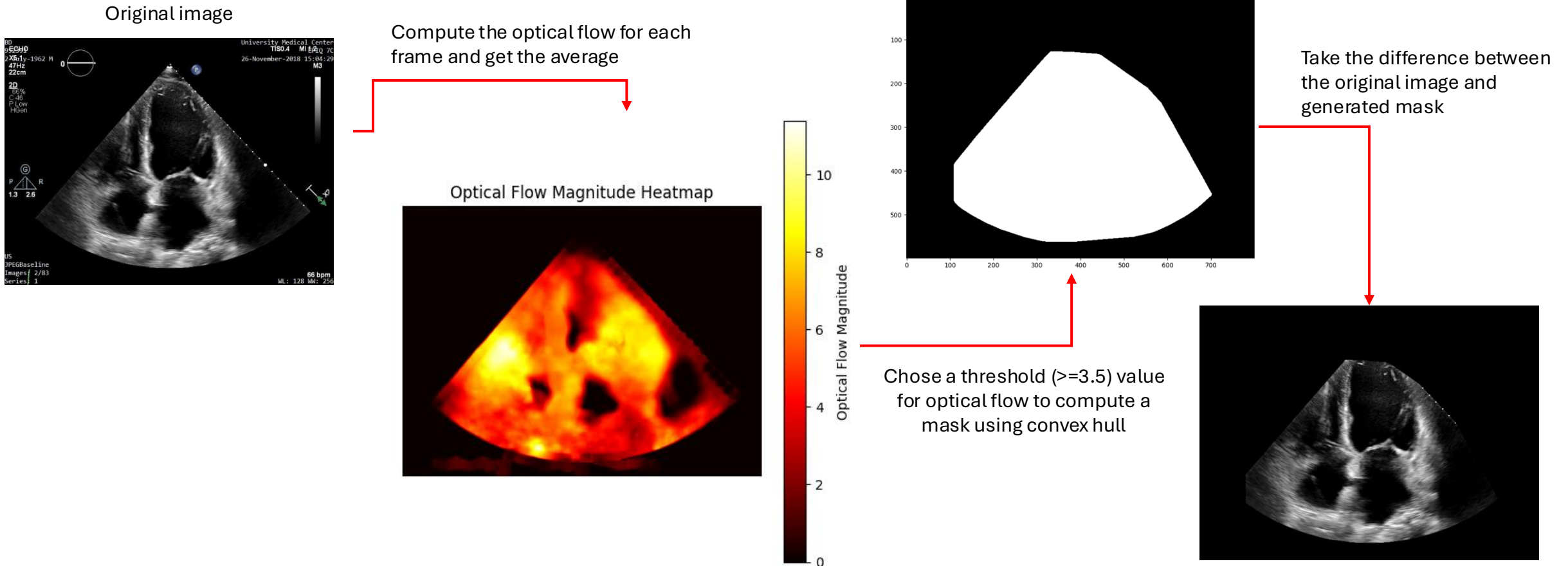
- Logit: Activation function softmax

- Avgpool: s=1, p=1, k=3



Private dataset cropping

Optical flow calculation was crucial for cropping all images accurately without losing information



Training Echonet over ResNet18

We trained for different video sizes

FLOPs: $1,8 \times 10^9$
Trainable Params: 66,350,018

ResNet18	28x28 (e)	56X56 (a)	112X112 (b)	28x28 (f) (Weighted)	56X56 (c) (Weighted)	112X112 (d) (Weighted)
Train Acc	0.97	0.93	0.92	0.94	0.92	0.94
Val Acc	0.87	0.87	0.88	0.83	0.86	0.88
Test Acc	0.85	0.87	0.87	0.81	0.85	0.86
Test AUROC	0.87	0.90	0.90	0.85	0.90	0.88
Test AUPRC	0.83	0.87	0.88	0.80	0.86	0.86

Epochs 5 5 7 5 5 9

Batch size 16 16 16 16 16 16

FLOPs: $11,3 \times 10^9$
Trainable Params: 236,190,658

ResNet152	28x28 (g)	56X56 (h)	112X112 (i)
Train Acc	0.87	0.92	0.98
Val Acc	0.86	0.87	0.86
Test Acc	0.88	0.86	0.85
Test AUROC	0.88	0.89	0.84
Test AUPRC	0.72	0.75	0.68

Epochs 2 3 2

Batch size 8 8 8

Training Echonet over ResNet18

We trained for different video sizes

FLOPs: $1,8 \times 10^9$
Trainable Params: 66,350,018

ResNet18	28x28 (e)	56X56 (a)	112X112 (b)	28x28 (f) (Weighted)	56X56 (c) (Weighted)	112X112 (d) (Weighted)
Test ACC	0.85	0.87	0.87	0.81	0.85	0.86
ACC class 0	0.90	0.95	0.97	0.84	0.88	0.96
ACC class 1	0.65	0.59	0.52	0.70	0.74	0.50

We chose model (c) for transfer learning for our private dataset.

Transfer learning with ResNet18

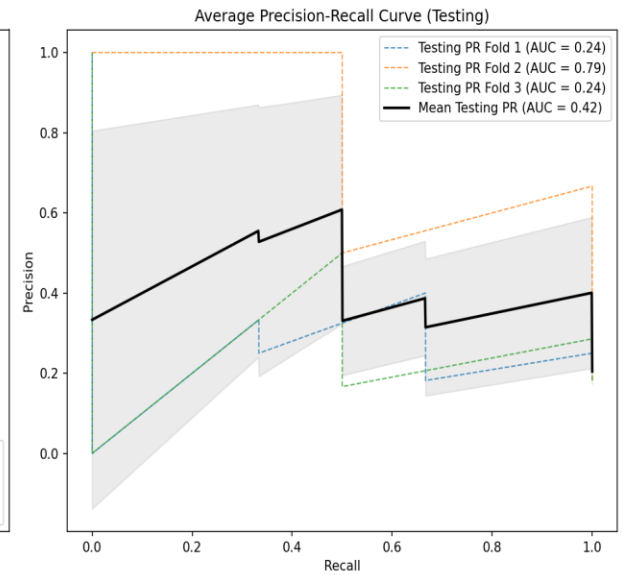
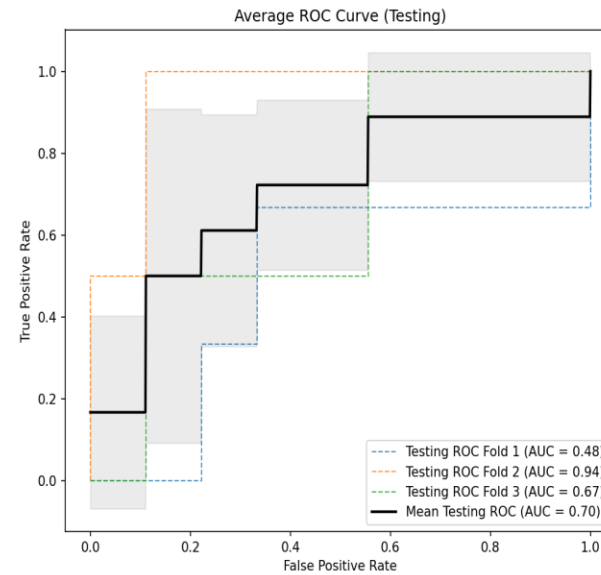
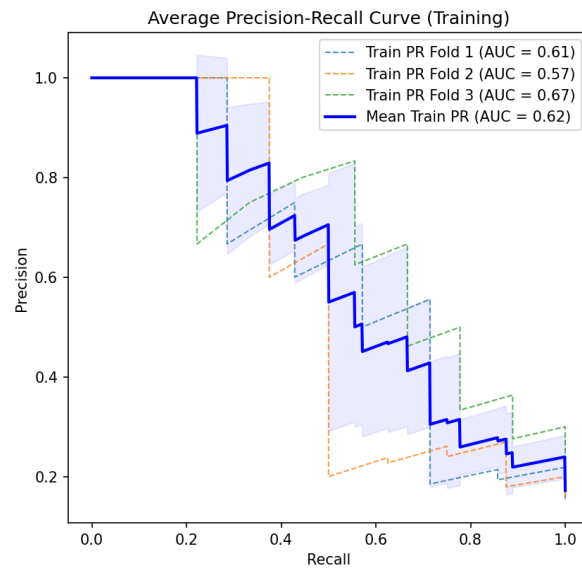
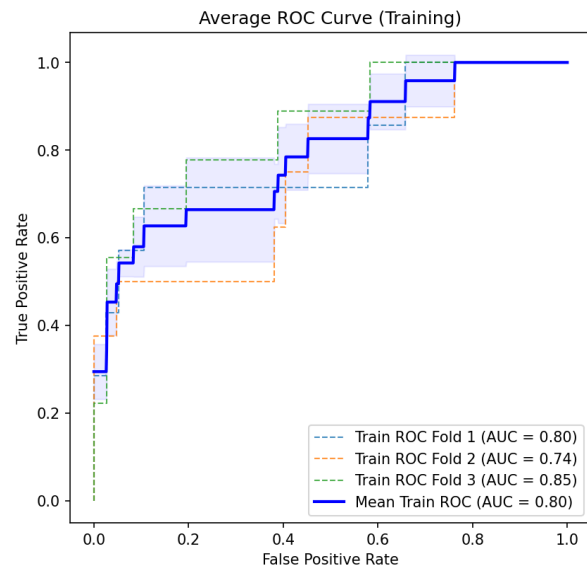
k fold	Model type	fcc dropout/ l1reg/ cnn dropout	Average of accuracy		Average of roc_auc		Average of pr_auc	
			test	train	test	train	test	train
7	(b)	0.8/0.1/0.8	0.700	0.790	0.690	0.895	0.530	0.719
5	(b)	0.9/0.1/0.9	0.733	0.816	0.760	0.884	0.758	0.720
3	(b)	0.8/0.095/0.8	0.629	0.599	0.698	0.798	0.422	0.617
2	(b)	0.8/0.3/0.8	0.794	0.829	0.548	0.690	0.442	0.455

k fold	Model type	fcc dropout/ l1reg/ cnn dropout	std accuracy		std roc_auc		std pr_auc	
			test	train	test	train	test	train
7	(b)	0.8/0.1/0.8	0.173	0.124	0.329	0.059	0.441	0.086
5	(b)	0.9/0.1/0.9	0.160	0.123	0.434	0.153	0.398	0.243
3	(b)	0.8/0.095/0.8	0.328	0.384	0.233	0.054	0.320	0.053
2	(b)	0.8/0.3/0.8	0.042	0.040	0.068	0.118	0.002	0.267

Transfer learning with ResNet18

5 fold experiment			Average of accuracy		Average of roc_auc		Average of pr_auc	
l1 reg	Model type	fcc dropout/ cnn dropout	test	train	test	train	test	train
0.1	(b)	0.1/0	0.790	0.872	0.653	0.954	0.453	0.844
0.1	(b)	0.2/0	0.733	0.857	0.693	0.948	0.392	0.820
0.1	(b)	0.3/0	0.819	0.820	0.787	0.875	0.542	0.632
0.1	(b)	0.4/0	0.762	0.853	0.613	0.947	0.450	0.818
0.1	(b)	0.9/0	0.671	0.993	0.573	1.000	0.366	1.000
0.1	(b)	0.9/0.9	0.733	0.816	0.760	0.884	0.758	0.720

Transfer learning with ResNet18 for 3 fold



Transfer learning with ResNet18 for 5 fold

