**Application 1:**

run generate\_data\_p0\_ssm\_for\_verify.py to get data for application 1 and application 2

run aorta\_abaqus\_analysis\_343c1.5\_matMean.py to get Table 1

**Application 2:**

run aorta\_FEA\_C3D8\_SRI\_inverse\_mat\_ex\_vivo.py to analyze each of the 7 cases

run analyze\_inverse\_mat\_ex\_vivo\_7cases.py to get Table 2

**Application 3:**

modify generate\_data\_p0\_ssm\_for\_verify.py to get data for this application

p0 id is from 0 to 342 (exclude 48 because it has self-intersection)

set delta = 0.05 to generate 20 must points

note: the data is in the folder app3/data

run analyze\_inverse\_p0.py to get Table 3

PyFEA-NN-P0:

run aorta\_inverse\_p0\_NN\_autoencoder\_disp.py to train the auto-encoder

run aorta\_FEA\_C3D8\_SRI\_inverse\_P0\_NN\_autoencoder\_disp.py to analyze each of the 7 cases

run postprocess\_inverse\_p0\_NN\_autoencoder\_disp.py to inflate zero-pressure geometry to p=10kPa

PyFEA-P0:

run test\_inverse\_p0.py to analyze each of the 7 cases (i.e., get the zero-pressure geometries)

the algorithm is implemented in aorta\_FEA\_C3D8\_SRI\_inverse\_P0\_R2b.py

run postprocess\_inverse\_p0.py to inflate zero-pressure geometry to p=10kPa

BD (backward-displacement):

Run test\_BackwardDisp.py to analyze each of the 7 cases (i.e., get the zero-pressure geometries)

the algorithm is implemented in aorta\_FEA\_C3D8\_SRI\_quasi\_newton\_BackwardDisp.py

run postprocess\_inverse\_p0.py to inflate zero-pressure geometry to p=10kPa

**Application 4:**

run aorta\_FEA\_C3D8\_SRI\_statical\_determinacy\_step1.py to generate data

run aorta\_FEA\_C3D8\_SRI\_statical\_determinacy\_step2.py to check data

run aorta\_FEA\_C3D8\_SRI\_statical\_determinacy\_step3.py to analyze each of the 7 cases

the algorithm is implemented in aorta\_FEA\_C3D8\_SRI\_inverse\_mat\_in\_vivo\_statical\_determinacy.py

run analyze\_statical\_determinacy\_7cases.py to get Table 4