NOTE:

This code is only applicable when data for the elements of FDM are readily available. If this information is not available, please use the code for the framework.

Instructions to run the code for the new FDM:

1. Copy all of the folders in the ***'…\The new FDM'*** to ***'…\MATLAB7\work'***.
2. Store the required data for the elements of the new FDM in***: '...\Subject_Data_FDM_phase_1'***
   Data that are required:
   - Arm angle range. This refers to the angle of maximum extension and flexion. For each participant, save this data as a .txt file into ***'...\Subject_Data_FDM_phase_1\Arm Angle Range'***. The data should be stored in the following format:

     Angle of full extension
     Angle of full flexion

     e.g.

     160.1598
     33.691
   - Cross section locations. This refers to the locations of UAF, UAM, E, LAM and LAF (in mm) for all key postures. For each participant, save the cross section locations into four .txt files (each file is for each key posture) in ***'...\Subject_Data_FDM_phase_1\Cross Section Location'***. The data should be stored in the following format:

     locations of UAF locations of UAM 0 locations of LAM locations of LAF

     e.g.

     95.1999 47.5762 0.0000 43.9595 87.2079

     Save the files into ***'...\Subject_Data_FDM_phase_1\Cross Section Location'***.
   - Cross section magnitudes. This refers to the distance (in mm) of the 16 sampling points towards the bone point for each key cross section. For each participant, save the cross section magnitudes into four .txt files (each file is for each key posture) in ***'...\Subject_Data_FDM_phase_1\Cross Section Magnitudes'***. The data should be stored in the following format:

     distance of 1st sampling points for UAF
     ....
     distance of 16th sampling points for UAF
     distance of 1st sampling points for UAM
     ...
     ...
     distance of 16th sampling points for LAF
   - Joint coordinates maximum flexion. This refers to the coordinates of the shoulder and wrist joints for a full flexion. The data should be stored in the following format:

     Coordinates of the shoulder (X Y Z) joint coordinates of the elbow joints (X Y Z)

     e.g.

     31.5228 272.2523 -91.2034 32.8377 238.8627 65.7937

     Save the data in ***'...\Subject_Data_FDM_phase_1\Joint Coordinates Maximum Flexion'***.
   - Joint length 3D. This refers to the coordinates of the shoulder and wrist joints of the arm during a full extension. The data should be stored in the same format as that of the maximum flexion. Save the data in ***'...\Subject_Data_FDM_phase_1\Joint length 3D'***.

- Profile front view. This refers to the coordinates (in mm) of the profile of the arm while being fully extended. For each participant, save the profile front view into two .txt files. The first file is for the coordinates of the left hand side of the profile's front view whereas the second file is for the coordinates of the right hand side of the profile's front view. Save the file into ***'...\Subject_Data_FDM_phase_1\Profile Front View'***.
- Profile magnitudes. This refers to the distance (in mm) of the points on the profile towards the corresponding bones. The locations of the points on the profile refers to the the optimisation's result performed in chapter 7. For each participant, save the distances into four .txt files (each file is for each key posture). Save the file into ***'...\Subject_Data_FDM_phase_1\Profile Magnitudes'***.

IMPORTANT: Please keep the file names consistent as the code use the file name to associate them. See examples of the existing files in the folders above.

3. Open and run: ***programming_prior_CS_refinement_FDM_validation_phase_1.m*** to predict the five key cross sections for a required arm angle.
4. Open and run: ***profile_any_posture_version_2_FDM_phase_1.m*** to predict the profile of a required arm angle.
5. Open and run: ***main_interpolation_ver_2_FDM_validation_phase_1_CP.m*** to generate the coordinates for the flesh deformation at the elbow for the required arm angle.
6. To visualise the result, use the following coordinates that are displayed on Matlab:
   - coordinates_UAF
   - coordinates_UAM
   - additional_CS_1
   - additional_CS_2
   - coordinates_E
   - additional_CS_3
   - additional_CS_4
   - coordinates_LAM
   - coordinates_LAF