Particle Age pipeline

1. Load the two last cycles (vtu files)
2. Change the model name in:
   1. Part1
   2. Part2
   3. Geo
   4. Plotting
3. Clip at the aneurysm inlet
4. Load the centerline, transform and check.
5. If clipped:
   1. set second\_cl\_clip = True
   2. Change name of Clip2 to Clip10
6. If not clipped
   1. Set second\_cl\_clip = False
7. Run part1 macro

Part\_1 macro

* Input: Clip1
* Creates a centerline from clip1 for the geometry script to read and then find the resampled points and normals. It copies the clip parameters at the inlet to a slice, which then computes the inlet geometric parameters and writes to “inlet\_area\_dia\_perimeter.csv”. It also prepares the GUI for part2.
* Output: “inlet\_area\_dia\_perimeter.csv”, “clipped\_centerline.vtp”

1. In the geo script, set particle calculation to True and run it. Check terminal and “geo\_log.txt”

The geo script

* Input: Clipped centerline
* Saves the points and tangents of the planes used for particle placement.
* Output:
  + Particle: "centerline\_points\_and\_tangents\_table.csv"
  + Geometry: 'geometric\_values.csv'

1. Click on the temp interpolator and add three clips, this will be the domain of the particles. One clip below the renals, and two for the iliac extensions.
2. Run part2 script from **script editor**
3. While you wait, copy the data from “inlet\_area\_dia\_perimeter.csv” to the right of the parameter table

Part\_2 macro

* Input: Clip3
* Iterates through the timesteps and places particles on five planes in the domain. The timestep size is 1ms due to the results being 10ms apart and the temp int. having a value of 0.1. The particles are placed every 10 ms but they are not counted after 950ms or 0.95s, which is the first cycle. The loop will break when there are no more particles in the domain with an injectionstepid of 950 or less. Meaning all the particles from the first cycle have left the domain.
* Output: f"particle\_age\_stats\_{i}.csv"

1. Check “particle\_log2.txt” for mismatches in particle count, if small enough its ok
2. Run plottingParticleAge.py in VS Code

The plottingParticleAge script

* Input: particle\_tracer\_stats\_{i}.csv
* Takes the particle age data and plots it over time, in addition to creating a csv file with the particle age combined stats, there you find the mean value
* Output: “Particle\_age\_final\_stats.csv”, “particle\_age\_plot\_png”

1. Copy the mean age from “Particle\_age\_final\_stats.csv”