DLCA of Spherical Particles

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Introduction

This is a brief version of the SOP explaining how to run the code and what each variable is. To look for some results and a detailed explanation of the algorithm read the longer version. I have uploaded some videos too. Feel free to email me if you have any questions.

List of Crucial Variables

- **mobility:**
  contains the mobility of each cluster at each iteration, what we have here is the mobility at the final iteration.
- **PAR:**
  PAR is the cell array that changes with every iteration so at the end of the iteration it contains the final position of the particles. (you can use this to access the data of the final iteration (end of the simulation)).
- **PAR_Rg:**
  PAR_Rg is the mapped version of PAR which is discussed in the radius of gyration section of the report.
- **PAR3:**
  PAR3 is the cell array that saves the centroid data at the end of each iteration, so PAR3{542} contains the centroid points in each cluster at the end of iteration number 542.
- **PAR_C**
  PAR_C is a matrix that contains the number of particles in each cluster at the end of the simulation. (If the value of PAR_C(i) = 0 this means that the correspond cell in PAR should be empty (PAR{i} = [ ])).
- **POS**
  POS is a matrix that contains the position of the particles at time = 0.

Rg3, mobility3, and PAR_Rg3 do what PAR3 does but for their respective variables.

Running The Program

- Choose the number of particles. (N)
  - Volume fraction will be the number of particle times the volume of each particle divided by the lattice size.
  - Pick a radius r.
  - Pick a volume fraction V_f.
  - The number of particles that you should pick is $N = \frac{V_f L^3}{\frac{4}{3}\pi r^3}$.
- Choose the desired number of iterations. (ITR)
- Choose the particle radius. (r)
- Choose the lattice size which will be a cube L by L by L. (L)
- filename will save a .gif file to the current MATLAB folder, pick a relevant name.
- Now you can run the code, follow the comments provided in the script and remember to **not run large systems** on your computer the program is heavy so pick your system shrewdly and preferably run them on a cluster.