

Start building your mpm solver! Choose a programming language (C++ is most recommended due to run-time speed.) The first step of a particle-based physics simulator is creating particles.

**Implement this one-page paper:**

Fast Poisson Disk Sampling in Arbitrary Dimensions, Robert Bridson

**Watch this video:**

CppCon 2014: Mike Acton "Data-Oriented Design and C++"

<https://www.youtube.com/watch?v=rX0ItVEVjHc>

**Build your code on top of good packages.**

In c++ I recommend 'Eigen' library.

**Requirement:**

Your Poisson Disk sampler needs to work for both 2D and 3D. In 3D, it should take a triangle mesh, and output a point cloud inside the mesh.

It can be a command line tool, a plugin, or a independent software. Keep in mind this sampler will be a component of your final course project (the MPM solver).

**You have two options:**

(1) Use openvdb to convert your mesh into a levelset. Then you can easily tell whether a point is inside or outside a mesh.

(2) You can do point-inside-mesh queries. You will need to use algorithms like Intersection of ray and triangles <http://geomalgorithms.com/a06- intersect-2.html>

Do a research on how to do point-inside-mesh queries.

**Recommended finish date:**

End of second week. 9/10.