STE6291-1
Finite Element Method Programming
Assignment

Use GMLib, Qt, C++ to develop a physical simulation of a circular membrane. An external constant force is applied to the membrane. The problem is to solve numerically the Poisson's equation and define the deformation of the membrane.

The domain (circular membrane) belongs to R^2. The force is applied normally to the domain. Material properties and time are not considered.

Use an example of GMLib application qmldemo. The scene file is called scenario.cpp.

Implementation steps:

- Create two classes: Node and FEMObject. The description of these classes is located in the lecture notes
- Declare an array of nodes
- Specify the set of points based on the regular or random triangulation and create a mesh by using the Delaunay triangulation method included in GMLib
- Compute the stiffness matrix and the load vector by using formulas from the lecture notes
- Solve the matrix equation
- Specify z-coordinates for the internal vertices
- Visualize the solution