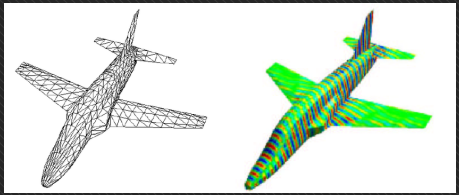


PC Tutorial 07: 2D Finite Element Method

Petr Kadlec

2022/11/09

2D FEM

1. Solve the 2D Poisson´s eq. using FEM with linear basis functions.

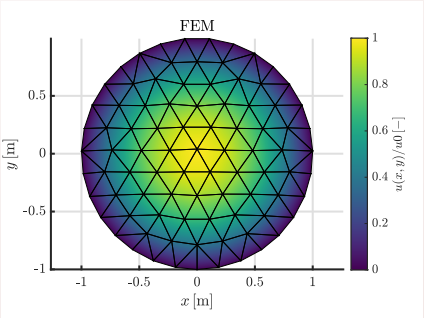
$$\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} = 4,\ \Omega:\ x^2 + y^2 \leq 1(\text{in m}).$$

$$u\left(\{x, y\} \in \delta\Omega\right) = b = 0\,\text{V},$$

Exact solution is:

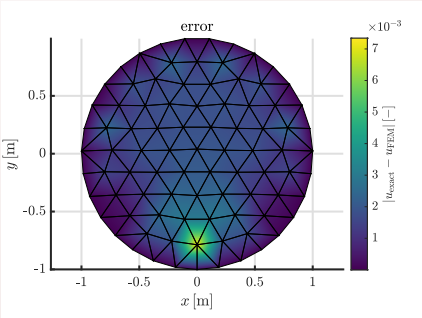
$$u\left(x, y\right) = 1 - x^2 - y^2.$$

Complete the live script *fem2D.mlx* and function *getCouplMatrix.mlx*.



2D FEM Error

1. Show the absolute error of the FEM solution compared to the analytical solution.



Thank you for your attention!

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