UNIVERSITY of HOUSTON

CENTER FOR ADVANCED COMPUTING & DATA SCIENCE

CACDS Workshop

Solving PDEs in Python

A FEniCS tutorial

What is the workshop about?

FEniCS is an open-source *finite element* package with extensive list of features. The workshop will contain tutorials on the use of FEniCS for solving PDE problems. We will cover hands-on tutorials in the following fields:

- **Reservoir and porous media simulations**: Idealized enhanced enhanced oil recovery problem is generated step-by-step. You will be able to calculate total flux at the production well for various pressures at the injection wells. Also, solutions of different FE formulations are discussed.
- **Solid mechanics**: Learn to solve a non-linear quasi-static problem with hyperelastic constitutive models.
- **Biofluid mechanics** : A mesh is generated on a surface of vascular segment extracted from a patient MRI image. Using transient FE, you will model blood flow for cardiac cycles.

When: June 26-27, 2018 (from 1 pm to 4 pm)
Where: MREB 200
(Computers with necessary software will be available with valid UH account)
Who: Anyone interested in learning to use the FEniCS package.
(Participants are expected to have familiarity with scientific computing with Python and basic understanding of finite element method.)

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