Adriann Liceralde, Dr. Nathan Moodie, Dr. Brian McPherson

Department of Civil & Environmental Engineering at the University of Utah

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**Hele Shaw Model Instructions**

**Introduction**

This step-by-step guide shows how to create a 3D model of a Hele-Shaw porous media cell that allows two-dimensional fluid flow.

**Materials**

* Python 3
* Inkscape
* Autodesk Fusion 360

**I. Retrieve Python Codes and MicroCT image**

1. Create a new folder which will now be referred to as the Work Folder.
2. Go to <https://github.com/Azshian/Hele-Shaw-Model> and download these files to the Work Folder.
   1. Python
   2. Python
   3. Python
3. Go to <https://www.imperial.ac.uk/earth-science/research/research-groups/perm/research/pore-scale-modelling/micro-ct-images-and-networks/>
4. View the different image scans by clicking on the network name. This guide will select **Sand Pack (LV60B).**
5. Click [**Download image (binary and ASCII)**](http://www3.imperial.ac.uk/pls/portallive/docs/1/46729696.ZIP)which will give a compressed zip file.
6. Extract the zip file and move the .dat file into the Work Folder. The .raw file is unused.

**II. Select slice from Pore Network**

1. Open HeleCode.py
2. Python HeleCode.py
   1. Will take a few seconds to load the network file
3. The **Area Selection** GUI will appear, with four sliders and four buttons. Click **Show** to open the image.
   1. The pore network is shown with the filled spaces as yellow and the void spaces as purple.
   2. The red border surrounding the network indicates the area selection.
4. Select the desired network
   1. Use the GUI slider **Y Top, Y Bottom, X Left,** and **X Right** to change the area selection.
   2. Use the **Height** slider to select the height level of the network.
   3. When values are changed, press the **Show** button to update the image
5. Press the **Cut** button to view the selected area.
   1. If more changes are desired, simply press the **Show** button again to view the full network with the red borders.
6. Once the desired area is found, press **Cut**, then press **Save** to save the pore network as a .png file in the Work Folder.