1 network extraction code – pnextract

pnextract extracts a conventional pore network from a microCT image. The algorithm is a rewrite of the Dong and Blunt (2009) code. There are major differences though. First, the pore and throat detection algorithm is revised; see Stages 1 and 2 described in Raeini et al. (2017) `https://doi.org/10.1103/PhysRevE.96.013312`. Raeini et al. (2017) is an extension of this code: it further analyses the image and extracts the details of the void space corners. The shape of pores in this code are deduced from shape factors, the shape-factor equation is changed compared to the old definition, see Bultrys et al (2018, currently under-review).

The new input file for the network extraction code is a mhd header file compatible with paraview and Fiji (ImageJ with plugins) with additional optional keywords specific to network extraction algorithm. See the file Image.mhd for a sample input.

1.1 Format specifications:

1. The order of the first 6 keywords should not be changed for compatibility with third-party software (ImageJ and Paraview)

2. Use "#" for comments

3. All keyword and its data should be given in a single line

1.1.1 Important keywords:

1 to 3rd keywords (should not be changed):

1. `ObjectType = Image`

2. `NDims =     3`

3. `ElementType = MET_UCHAR`

4. keyword: `DimSize` – used to assign the dimensions of the image: Nx, Ny and Nz

5. keyword: `ElementSpacing` – used for assigning voxel size: x, y and z should be equal

6. keyword: `ElementDataFile` – specifies the name of binary 8bit data file, ascii (.dat) files are supported by pnextract too

```
ObjectType = Image
NDims =      3
ElementType = MET_UCHAR

DimSize =      400    400    400
ElementSpacing = 5.345 5.345 5.345
Offset =       0      0      0

ElementDataFile = Berea.raw
```

Fig. 1: Sample input header file

Further description to follow in future. For any queries please contact Ali Q. Raeini: a.qaseminejad-raeini09@imperial.ac.uk