http://au.mathworks.com/matlabcentral/fileexchange/43400-skeleton3d

This code calculates the 3D medial axis skeleton of an arbitrary 3d binary volume. It is an optimized MATLAB implementation of the parallel homotopic thinning algorithm described in [1]. We developed it to quantify the network of cell processes in bone [2], but it should work on images of any tubular or filamentous structures. An example volume (testvol.mat) is included, along with an example script (Test\_Skeleton3D.m). Any comments, corrections or suggestions are highly welcome.

Usage:

skel = Skeleton3D(bin)

where "bin" is a 3D binary image, and "skel" the resulting image containing only the skeleton voxels.

This code is inspired by the ITK implementation by Hanno Homann [3] and the Fiji/ImageJ plugin by Ignacio Arganda-Carreras [4].

If you include this in your own work, please cite our original publicaton [2].

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References:

[1] Ta-Chih Lee, Rangasami L. Kashyap and Chong-Nam Chu   
"Building skeleton models via 3-D medial surface/axis thinning algorithms."   
Computer Vision, Graphics, and Image Processing, 56(6):462-478, 1994.

[2] Kerschnitzki, Kollmannsberger et al.,   
"Architecture of the osteocyte network correlates with bone material quality."   
Journal of Bone and Mineral Research, 28(8):1837-1845, 2013.

[3] <http://hdl.handle.net/1926/1292>

[4] <http://fiji.sc/wiki/index.php/Skeletonize3D>