MAVI: A Modular System for the Quantitative Analysis of Volume Images

Björn WAGNER, Katja SCHLADITZ, Michael GODEHARDT, Fraunhofer ITWM, Kaiserslautern, Germany

Abstract. Quantitative analysis of microstructures using 2d images of intersections or fracture surfaces is a standard tool in material's characterisation. 3d images obtained by computer tomography open the
opportunity not just to do the same analysis non-destructively but to use the full spatial information on the microstructure. This allows e.g. to quantify anisotropies in the structure or to describe the 3d shape of particles, pores, or cells.
MAVI (modular algorithms for volume images) provides an environment for the quantitative geometric analysis of microstructures in 3d. Basic
measurements of a whole component or of individual objects(inclusions, cracks,...) combined with a variety of morphological transformations yield quantitative results. Efficient implementations of the Euclidean distance transformation and the
watershed transform allow the separation of touching particles as well as the reconstruction of cells, e.g. in open foams.
We present the scope of MAVI by means of examples: refractory concrete, open and closed polymer and metal foams, technical textiles, sinter structures.