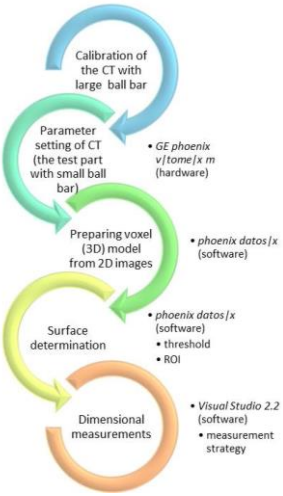
Investigations on measurement uncertainty in case of industrial CT

Agota DREGELYI-KISS*, Numan DURAKBASA**

** Bánki Donát Faculty of Mechanical and Safety Engineering, Óbuda University, Budapest, Hungary, dregelyi.agota@bgk.uni-obuda.hu*
***Institute of Production Engineering and Laser Technology, Technical University of Wien, Austria, numan.durakbasa@tuwien.ac.at*

Keywords: industrial CT, measurement uncertainty

More recently, the industrial CT equipment is used not only for non-destructive analysis but to perform geometrical evaluations. The three dimensional, optical dimensional measurements made by CT are popular because the measurement time is much more less than in case of traditional 3D measurement machines, furthermore the inner geometries can be determined by non-destructive manner.



During this research a milled aluminium test part was designed and manufactured. Some geometry was measured by tactile CMM machine to get the true values of the characteristics, and measurements were performed by industrial computer tomography where the parameters of the reconstruction process were varied systematically. The effects of these threshold and other parameters were investigated on the dimensional measurement error.

Fig. 1.
Flowchart of the CT measurement process

[1] J. Hiller, P. Hornberger: Measurement accuracy in X-ray computed tomography metrology: Toward a systematic analysis of interference effects in tomographic imaging. Precision Engineering, 2016, 45, 18-32.

[2] M. Bartscher, J. Illemann, U. Neuschaefer-Rube: ISO test survey on material influence in dimensional computed tomography. Case Studies in Nondestructive Testing and Evaluation, 2016, 6, 79-92