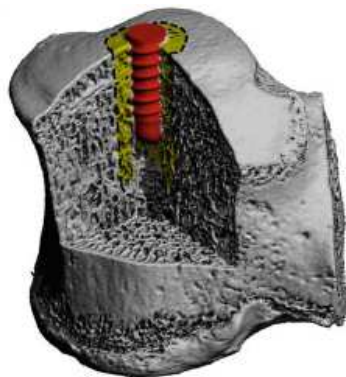


μ FE Failure Analyses of a Bone-Implant System

Failure investigations of bone-implant systems (see Figure) are usually done by using mechanical tests. Numerical simulations allow to analyse not only the failure process but provide also an insight into the distinct failure mechanisms. The main working steps of the thesis consist of image processing, model generation, meshing, solving, and post-processing of a clinical relevant bone-implant system in the fully non-linear range (material, geometry, contact). Furthermore, the non-linear results should be compared to simplified linear μ FE failure evaluations based on Pistoia's rule. The major challenge will be the model size. If the bone micro-architecture is taken into account special techniques like sub-modelling will be necessary to keep the model size reasonable.

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