OPTIMIZATION OF A TWO-COMPONENT IMPLANTOLOGY SYSTEM USING GENETIC ALGORITHM

Krzysztof Szajek

Budsoft

ABSTRACT

The paper deals with an optimization of a reference two component implantology system in terms of problems observed in its utilization and implantation such as fatigue and static failure, screw loosening, tightening inaccuracy, diameter reduction and tightness. The simplified (axisymmetric) FE model, yet, capable to provide all required output with acceptable accuracy is used. The model is supplemented with procedures for rapid fatigue life and tightening/loosening moment estimation. The multiobjective optimization task is solved using weighted sum approach, where weights are estimated on the basis of Analytic Hierarchy Process approach. The optimization problem is solved with the use of genetic algorithm hybridized with Hooke Jevees procedures within self-made optimization module for Abaqus/CAE.