

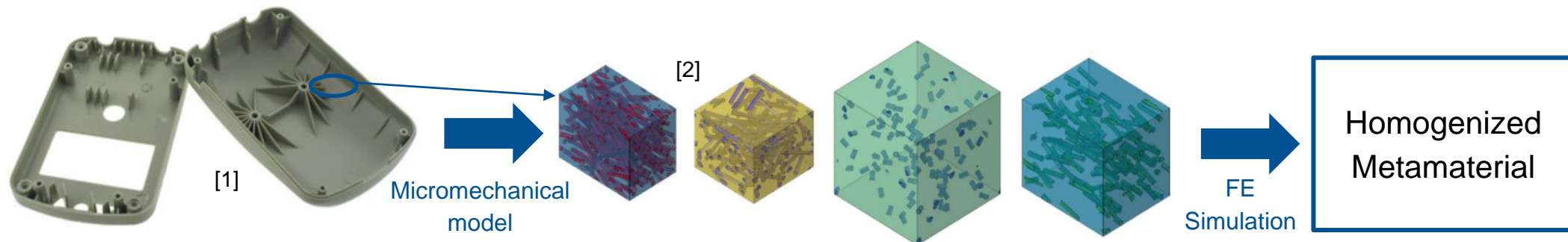
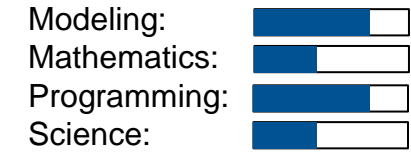
Virtual characterization of short fiber reinforced plastic

Task

Development of an integrated Abaqus-Python tool that handles the numerical analysis of the micromechanical composite unit cells:

- Automatic CAD generation of the representative volume element with varying geometric parameters of the fibers
- Meshing of the geometry and assignment of periodic boundary conditions using Python libraries
- Automatized postprocessing of the simulation results, after the execution of the Abaqus analysis
- Design of experiments with variation of geometric parameters of the fibers using Python libraries
- Optimization of the design variables to maximize the mechanical performance of the material (stiffness, strength)

Project Characteristics



[1] epectec.com

[2] Breuer, K.; Stommel, M. Prediction of Short Fiber Composite Properties by an Artificial Neural Network Trained on an RVE Database. *Fibers* 2021, 9, 8.