

## SOFTWARE TOOLS

(\* free or open-source software)

### **CAD, Preprocessing, Meshing**

SolidWorks | ProEngineer | PTC Creo | FreeCAD\* | ANSYS und Abaqus Preprocessing & Meshing | Altair Hypermesh | NetGen\* | Salome\* | OpenCascade\* | SnappyHexMesh\* | Gmsh\* | cfMesh\* | blockMesh\*

### **FE, MBS, Particles, System Modeling| Mechanics, Heat Transfer, CFD, Electromagnetics, Multi-Physics**

ANSYS: Mechanical | Acoustics | CFD | Maxwell | HFSS | Icepak | Siwave  
Abaqus mit Tosca, Isight, FE Safe  
Altair Hyperworks  
LIMIT  
FEMM\* | ProFEMAG\* | CST  
LIGGGTHS\* | NGSolve\* | OpenFOAM\* | Caelus\* | code\_aster\*  
OpenModelica\* | Dymola | MapleSim

### **Electronics, Circuit Simulation**

LTSpice | Altium

### **Automation, Virtual Commissioning, Digitalization, Robotics**

industrialPhysics | Vires VTD | esmini\* | ROS | Gazebo | FIWARE\* | LabVIEW

### **LCM Software Tools**

SyMSpace\* | HOTINT\* | X2C\* | TechCalc

### **Mathematics, Numerics, Visualization and Postprocessing**

MATLAB Simulink | SciLab/Xcos\* | Mathematica | Maple | Python\* | Paraview\*

### **Machine Learning, AI, Data-based Models, Hybrid Models / Combined Physics- and Data-based Simulation**

PyTorch\* | TensorFlow\* | Python\* | Keras\* | MATLAB

### **Software development, Programming, Scripting**

C/C++ | Python | Java | JavaScript | C# | Visual Studio | GitLab