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UG – A flexible software toolbox for solving partial differential equations

We will give an overview of the features and the capabilities of *UG*. Our goal is the development of a parallel software-platform for solving partial differential equation problems. State-of-the-art numerical methods have been developed and implemented for the efficient and comfortable solution of real-world application problems. Emphasis is laid on the following topics: distributed unstructured grids, adaptive grid refinement, derefinement/coarsening, robust parallel multigrid methods, various FE and FV discretizations, dynamic load balancing, mapping and grid partitioning. Some important application examples will be presented including structural mechanics, two-phase flow in porous media, Navier-Stokes problems (CFD) and density-driven groundwater flow.

Reference: P. Bastian, K. Birken, K. Johannsen, S. Lang, N. Neuss, H. Rentz-Reichert, and C. Wieners, UG - a flexible software toolbox for solving partial differential equations, *Computing and Visualization in Science* **1** (1997), pp. 27–40.