The Distributed and Unified Numerics Environment (DUNE)

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Oliver Sander

Institut für Numerische Mathematik
Technische Universität Dresden
Zellescher Weg 12-14, 01069 Dresden, Germany
e-mail: oliver.sander@tu-dresden.de, web page: www.math.tu-dresden.de/~osander

ABSTRACT

DUNE is a set of open-source C++ libraries that provide low- and intermediate-level infrastructure for the implementation of finite element and finite volume methods. It is not tied to any particular application, and aims for extreme flexibility and efficiency. Example components are libraries for the handling of computational meshes, shape functions, linear algebra, and grid functions. Each component provides a well-defined interface and several implementations of this interface. This allows, e.g., to switch between different mesh data structures or finite element spaces with minimal effort. Interdependencies between individual libraries are very loose, and well-specified.

The focus on abstract interfaces and modularity make DUNE an ideal basis for standardization efforts, and it greatly helps to increase the source-level interoperability between different simulation codes. DUNE is developed by an active community of people mainly from universities and research institutes. It is available under an open-source license, and runs on a variety of platforms, including large-scale supercomputers.

More information: www.dune-project.org