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Creating sustainable research software by the example of the deal.II library

Donnerstag, 27. Oktober 2022 12:55 (45 Minuten)

In my talk, I will present the library deal.II, an open-source software aiming at the rapid development of simulation codes for partial differential equations based on the finite element method. The guiding principle of deal.II is to provide functions for the main building blocks in a solver that a user code can then combine and extend in an application-specific way. I will then give insight into my experience from starting or guiding several application projects that build on top of these abstractions. Across diverse scientific fields, spanning from geoscience over computational fluid dynamics to material sciences, there is a common mathematical underpinning that allows to re-use software concepts and contribute with new knowledge. A particularly important contribution of my work has been on the high-performance computing aspects of these projects, enabling solvers to run efficiently on current and evolving hardware architectures. We identified many possibilities to share knowledge and create synergies on the application side and to perpetuate our efforts by benchmarks as well as interaction with other big finite element projects.

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Sitzung Einordnung: Invited Talks