Easing and promoting the application of ML and AI in earth system sciences - introducing the KI:STE platform

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Earth system modeling is virtually impossible without dedicated data analysis. Typically, data are big and due to the complexity of the system, adequate tools for the analysis lie in the domain of machine learning or artificial intelligence. However, earth system specialists have other expertise than developing and deploying state-of-the art programming code which is needed to efficiently use modern software frameworks and computing resources. In addition, Cloud and HPC infrastructure are frequently needed to run analyses with data beyond Tera- or even Petascale volume, and corresponding requirements on available RAM, GPU and CPU sizes.

Inside the KI:STE project (www.kiste-project.de), we extend the concepts of an existing project, the Mantik-platform (www.mantik.ai), such that handling of data and algorithms is facilitated for earth system analyses while abstracting technical challenges such as scheduling and monitoring of training jobs and platform specific configurations away from the user.

The principles for design are collaboration and reproducibility of algorithms from the first data load to the deployment of a model to a cluster infrastructure. In addition to the executive part where code is developed and deployed, the KI:STE project develops a learning platform where dedicated topics in relation to earth system science are systematically and pedagogically presented.

In this presentation, we show the architecture and interfaces of the KI:STE platform together with a simple example.