Heterogeneous Data and Large Representation Models in Science

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Scientific Foundation Models for Computational Fluid Dynamics: threats and opportunities

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Scientific Foundation Models (SciFMs) hold the promise of accelerating numerical simulation of physical phenomena. In recent years, a myriad of SciFMs for weather forecasting have been proposed by major companies (e.g., Microsoft's ClimaX and Aurora) as well as research centers (e.g., ECMWF's AIFS). The development of SciFMs in other domains such as Computational Fluid Dynamics (CFD) has not yet reached similar maturity levels, though. In this presentation, we discuss threats and opportunities surrounding the training and deployment of SciFMs for CFD. On the one hand, weather forecasting historically benefits from open data sharing thanks to government-funded research. On the other hand, CFD community is mainly backed up by proprietary software from industry, which limits sharing of information and eventually impacts SciFM development. Still, recent initiatives in open CFD data sharing like BLASTNet give hope that open-sourced SciFMs for CFD will become available in a near future.

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Short

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