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“On the design of anisotropic kernels for flow simulation”

Kernel-based approximation methods are well-established tools in scattered data approximation. Radial kernels (i.e. "radial basis functions") have proven a good performance in relevant applications, in particular for their approximation quality and computational efficiency. In this talk, we explain our recent work on the design of more flexible kernels, as they are required in fluid flow simulation. To this end, we construct anisotropic positive definite functions adapted to the geometry of the domain. This will be achieved through a deformation of the Euclidean norm by using symmetric positive definite matrices. We expect that the new kernels will help to further improve the performance of kernel-based fluid flow simulation methods.