

# Customized Approximation with Radial Basis Functions

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Radial basis functions (RBFs) have been gaining popularity in recent years. They were used initially to reconstruct unknown “target functions” given data at a few points. However, RBFs turn out to be very flexible and have a broad range of applications. Today they are used in topography, medical imaging, and artificial intelligence, to name a few.

Recently it has been shown that radial basis functions can be “customized” so that the RBF approximant has similar physical properties as that of the underlying target function, such as being divergence-free or curl-free. Further, these ideas can be extended to manifolds. We will give a brief introduction to RBFs, see how they can be applied to vector fields, and discuss a few simple examples. This talk should be accessible to a general audience.

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**3:50 PM**