Radial basis function approach to modeling dynamical systems.
DIETMAR REMPFER, PARITOSH MOKHASI, IIT, Chicago — We are interested
in developing dynamical systems models that are based on discrete multivariate time
series information only, with application to fluid flow phenomena. A method that
uses radial basis functions and linear multi-step methods is developed to construct
continuous nonlinear models that approximate the original dynamical system. Infor-
mation, such as the structure of the original system, is incorporated into the models
through weak constraints. The formulation of the model and its advantages associ-
ated with modeling are described. Different examples are presented that highlight
the various characteristics of the model and its effectiveness in dealing with various
problems encountered in fluid flow.

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