Toward a RBF-based fitting model in the Laplace Transform Inversion framework

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In several applications a functional description of the experimental samples allows to adopt mathematical tools for the data analysis. We focus on a Laplace Transform Inversion (LTI) framework where multi-exponential samples are, firstly, represented by a fitting model and subsequently a continuous function is adopted to extract knowledge from data. In [1] an exponential-polynomial smoothing spline, in B-spline form, has been defined based on the Bernstein-like bases. Unfortunately, this model is sensible to the nodes distribution and to the basis choice involving, in some cases, numerical issues on the conditioning and the stability of the B-splines computation [2]. In this work, the main idea is to explore the possibility to apply the Radial Basis Functions in the fitting model for the LTI data analysis with the aim to study and to analyze their impact on the performances of the inversion methods.

References

[1] Rosanna Campagna, Costanza Conti, Salvatore Cuomo, *Smoothing exponential-polynomial splines for multiexponential decay data*, *submitted*

[2] Rosanna Campagna, Costanza Conti, Salvatore Cuomo, *Laplace Transform Inversion for multiexponential decay data by smoothing L-splines*. Numerical Computations: Theory and Algorithms NUMTA 2019, 43