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Title: MOWM: Multiple Overlapping Window Method for RBF based missing value prediction on big data

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Abstract: The problem of missing values in the process of data acquisition is becoming critical due to both hardware failure and human error. Radial Basis Function based interpolation and missing value prediction in the dependent variable through surface fitting has been the viable solution from a long time. However, the solution works well on the idea of building one equation of 'N' weight variables corresponding to each sampled data point from a set of 'N' samples. Still, because of the inherent computations, it demands big primary memory when 'N' becomes large. Hence, on a memory-restricted setup, sometimes it suffers from the memory overflow problem. In this paper, we propose a novel data decomposition based RBF enabled surface fitting approach by building and aggregating multiple small models in an overlapping manner, which works well even with smaller primary memory with minimal impact on loss of generality. We also consider two hyperparameters as window size and overlapping index in order to tune bias-variance tradeoff. The proposed approach is applied to ten real-world datasets having multiple dimensions and results are found competitive while comparing with single trained model and Kernel Ridge Regression. Therefore, we believe this approach will rejuvenate the RBF based surface fitting method in attaining better performance in the Big data world too. (C) 2019 Elsevier Ltd. All rights reserved.

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