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### Random forest missing data algorithms

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### Abstract

Random forest (RF) missing data algorithms are an attractive approach for imputing missing data. They have the desirable properties of being able to handle mixed types of missing data, they are adaptive to interactions and nonlinearity, and they have the potential to scale to big data settings. Currently there are many different RF imputation algorithms, but relatively little guidance about their efficacy. Using a large, diverse collection of data sets, imputation performance of various RF algorithms was assessed under different missing data mechanisms. Algorithms included proximity imputation, on the fly imputation, and imputation utilizing multivariate unsupervised and supervised splitting—the latter class representing a generalization of a new promising imputation algorithm called missForest. Our findings reveal RF imputation to be generally robust with performance improving with increasing correlation. Performance was good under moderate to high missingness, and even (in certain cases) when data was missing not at random.

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