

Missing Data Analysis

High-Dimensional Imputation

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The sources listed below represent an overview of the work on high-dimensional missing data imputation. This list is certainly not exhaustive—and may not be especially representative—but it should provide a good starting point for readers interested in learning about the current state-of-the-art in missing data imputation for high-dimensional problems.

Although most of these sources discuss/evaluate several different imputation methods, I have attempted to classify each paper by its primary focus.

Overviews/Comparisons

- Drechsler, J., & Reiter, J. P. (2011). An empirical evaluation of easily implemented, nonparametric methods for generating synthetic datasets. *Computational Statistics and Data Analysis*, 55(12), 3232–3243. doi: 10.1016/j.csda.2011.06.006
- García-Laencina, P. J., Sancho-Gómez, J.-L., & Figueiras-Vidal, A. R. (2010). Pattern classification with missing data: A review. *Neural Computing & Applications*, 19(2), 263–282. doi: 10.1007/s00521-009-0295-6
- Junninen, H., Niska, H., Tuppurainen, K., Ruuskanen, J., & Kolehmainen, M. (2004). Methods for imputation of missing values in air quality data sets. *Atmospheric Environment*, 38(18), 2895–2907. doi: 10.1016/j.atmosenv.2004.02.026
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- Saar-Tsechansky, M., & Provost, F. (2007). Handling missing values when applying classification models. *Journal of Machine Learning Research*, 8, 1217–1250.

Single Imputation using Classification/Regression Trees

- Borgoni, R., & Berrington, A. (2013). Evaluating a sequential tree-based procedure for multivariate imputation of complex missing data structures. *Quality & Quantity*, 47(4), 1991–2008. doi: 10.1007/s11135-011-9638-3
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Single Imputation using K-Nearest Neighbors

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- García-Laencina, P. J., Sancho-Gómez, J.-L., Figueiras-Vidal, A. R., & Verleysen, M. (2009). K nearest neighbours with mutual information for simultaneous classification and missing data imputation. *Neurocomputing*, 72(7–9), 1483–1493. doi: 10.1016/j.neucom.2008.11.026
- Kim, H., Golub, G. H., & Park, H. (2005). Missing value estimation for DNA microarray gene expression data: local least squares imputation. *Bioinformatics*, 21(2), 187–198. doi: 10.1093/bioinformatics/bth499
- Troyanskaya, O., Cantor, M., Sherlock, G., Brown, P., Hastie, T., Tibshirani, R., ... Altman, R. B. (2001). Missing value estimation methods for DNA microarrays. *Bioinformatics*, 17(6), 520–525. doi: 10.1093/bioinformatics/17.6.520
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Single Imputation using Artificial Neural Networks

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Multiple Imputation

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