
Missing Values

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Types of Missing Values

There are 3 types of missing data

1. Not Missing at Random (NMAR)
2. Missing at Random (MAR)
3. Missing completely at Random (MCAR)

Dealing with Missing Values

A common approach to handle missing data is to infer the missing value, but this itself turns into a prediction problem. Inferring the mean or most common value is just a crude prediction.

Filling in the wrong value can bias predictions from it, of course, but this is just saying that not-missing data is better than missing data. In some cases you are forced to infer a value to make the prediction process work, like with an SVM or logistic regression.

Dealing with Missing Values..2

I'd say it's ideal to use an algorithm that can more directly deal with missing values and model it as missing or uncertain. For example you can modify Random Decision Forests to account for this directly

Handling Missing Values

For Missing completely at Random (MCAR) these are the different ways to handle the missing values

 Maximum Likelihood

 Expectation Maximization

 Pairwise Deletion

 Listwise Deletion

Handling Missing Values..2

 Mean/Median Imputation

 Regression Imputation

 Hot/cold deck Imputation

 Case Substitution

 Prior Knowledge

Thank You!

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