Self Organizing Maps: Theory and Implementation in *R*

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Abstract

When analyzing a large amount of data, identifying similarities (patterns) between data points is an effective way to obtain useful information from the data set. In these cases, unsupervised machine learning techniques are often used.

Self-Organising Maps (SOM) are a machine learning technique used to represent complex multivariable elements (belonging to a multidimensional space) on a simpler output space, made typically of a two-dimensional map. SOMs thus allow the tracing of similarities on a map that is comprehensible to the human brain in a way that would not be possible in the original multi-dimensional input space. Projecting a complex input on a simpler output map allows to more easily identify clusters of similar data and is therefore a powerful data analysis tool.

The aim of this article is to present the SOM technology in a simple way, accessible also for non-technicians, and illustrate how to implement it using the *R* programming language and data analysis environment.

References

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