

Self-organized Maps for Flow Cytometry Data Analysis

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Self-organizing map (SOM) [1] is an artificial intelligence method for clustering, visualization and analysis of high-dimensional data. It can efficiently handle large datasets and makes no assumptions on underlying dataset distributions. These properties make SOMs attractive for the analysis of flow cytometry (FCM) data. SOM neural network has a neurobiological background and simple and elegant mathematical model. It is an approach widely used in different domains, yet there were a few attempts to apply SOM in the FCM. Here, findings and ideas from an exploratory research will be presented, with a goal to get an objective assessment of the accuracy of the obtained clustering results. The R package *kohonen* [2] was applied to cluster three flowCAP datasets. Visualization of the results indicates that SOM might help us in automatic feature selection. Focus of the current investigation is to determine whether this is an accurate algorithm for cell population identification. Validation of the clustering results will inform the future direction of this research, as there are two potentially interesting SOM variants.

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References:

1. Kohonen T., Self-organizing Maps, Springer, 2006.
2. Wehrens R. and Buydens L.M.C. Self- and Super-organizing Maps in R: The kohonen Package, Journal of Statistical Software, 27(5), 2007.