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Taxonomic Classification for Living Organisms Using Convolutional Neural Networks

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Abstract : Taxonomic classification has a wide-range of applications such as finding out more about the evolutionary history of organisms that can be done by making a comparison between species living now and species that lived in the past. This comparison can be made using different kinds of extracted species' data which include DNA sequences. Compared to the estimated number of the organisms that nature harbours, humanity does not have a thorough comprehension of which specific species they all belong to, in spite of the significant development of science and scientific knowledge over many years. One of the methods that can be applied to extract information out of the study of organisms in this regard is to use the DNA sequence of a living organism as a marker, thus making it available to classify it into a taxonomy. The classification of living organisms can be done in many machine learning techniques including Neural Networks (NNs). In this study, DNA sequences classification is performed using Convolutional Neural Networks (CNNs) which is a special type of NNs.

Keywords : deep networks, convolutional neural networks, taxonomic classification, DNA sequences classification
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