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Finding the Branches on the Tree of Life

University of Waterloo Cheriton School of Computer Science (Canada)

May 18, 2022

The Deep Learning for Unsupervised Clustering of DNA Sequences (DeLUCS) technique developed by researchers at Canada's University of Waterloo and Western University draws taxonomic relationships between organisms via unsupervised machine learning. Waterloo's Lila Kari said DeLUCS determines these relationships "across a range of genetic datasets from organisms as diverse as vertebrates, bacteria, and viruses." The researchers compared genomes of organisms using frequency chaos game representation (FCGR), a graphical depiction of base sequences in DNA showing how often a particular nucleotide sequence occurs. The process generates FCGR pairs of sequences and mimics as input to an artificial neural network, "from which it finds patterns that can be used to create clusters," Kari said. "This method has an accuracy of almost 80%, and often much better."

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