Digital Total - Computing & Data Science an der Universität Hamburg und in der Wissenschaftsmetropole Hamburg



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Hyperbolic Learning on Omics Data

Many objects in biology are connected by hierarchical relationships. To clarify how snippets of data are associated, we apply embeddings, that is, mapping of multidimensional objects into space so that similar objects are positioned at close points. Analyzing such data with tools operating in Euclidean spaces is problematic as the tools may not account for the underlying data hierarchy. We applied several dimensionality reduction methods based on hyperbolic geometry to diverse datasets including gene expression, gene interaction, microbiome composition, and gene phyletic patterns. We compare hyperbolic embeddings to the more conventional ones (PCA, UMAP) and discuss the difference.

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Keywords

hyperbolic learning, dimensionality reduction

TentID

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