
MEGAN OWEN, Fields Institute

Applications of the space of metric trees

The space of metric n -trees is a polyhedral complex, in which each polyhedron corresponds to a different tree topology. Under the construction of Billera, Holmes, and Vogtmann, this space is non-positively curved, so there is a unique geodesic (shortest path) between any two trees. Furthermore, the (Frechet) mean of a set of trees in this space is well-defined and computable by an iterative algorithm. We present properties of this mean tree, including some non-Euclidean "sticky" behaviour, as well as applications to biological problems in phylogenetics and medical imaging.