Title: Discretization of length mètrics

Abstract: We propose to imagine that every manifold with a Riemannian or Finsler metric is discrete at the small scale, structured as a CSS complex (a.k.a. simplicial set), made of tiny ordered simplices. The 1-skeleton of this complex is a directed graph and has a natural metric ---the "fine" metric--- which assigns to each edge a length 1 or 0 according to whether the edge is traversed in the forward or backward sense.

   We conjecture that every Finsler metric on a compact n-manifold may be replaced by such a discrete structure, whose lengths and total volume (i.e. the number of n-simplices) are approximately proportional to the lengths and Holmes--Thompson volume of the original Finsler metric. We discuss partial results and implications of this conjecture.