Iterates of Maps which are Non-expansive in Hilbert's Projective Metric.

Jeremy Gunawardena; Cormac Walsh

Abstract: The cycle time of an operator on R^n gives information about the long term behaviour of its iterates. We generalise this notion to operators on symmetric cones. We show that these cones, endowed with either Hilbert's projective metric or Thompson's metric, satisfy Busemann's definition of a space of non-positive curvature. We then deduce that, on a strictly convex symmetric cone, the cycle time exists for all maps which are non-expansive in both these metrics. We also review an analogue for the Hilbert metric of the Denjoy-Wolff theorem.