Type: Talk

The intimate connection between matrix means and Riemannian geodesics

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After a long struggle the concept of matrix geometric mean has been understood as the barycenter in a non-Euclidean geometry in the set of positive definite matrices.

This result has been somewhat surprising, but it appears more natural as soon as one observes that for positive real numbers a substantial equivalence exists between geodesics in Riemannian geometries and associative means.

We exploit this connection to provide ways to extend means from positive numbers to positive definite matrices and investigate the properties of the different extensions.

Some case studies, such as the definitions of power means of matrices, are presented.

This is a joint work with Nadia Chouaieb and Maher Moakher of the University of Tunis El Manar, Tunisia.

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