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The distance between frames and between subspaces of a Hilbert space

Abstract

We make a deep study of the distance between frames and between subspaces of a Hilbert space. There are many surprises here. First, of the six standard ways of measuring distance between subspaces, 5 of them are equal and the sixth, chordal distance, is within a factor of 2 of the others. We also show that the vectors giving chordal distance are biorthogonal - which the definition does not indicate. There are many more surprising results here.

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