The volume of the spatial region corresponding to \( n \times n \) correlation matrices.

Given a symmetric, square matrix with 1’s on the diagonal and the remaining entries chosen randomly from \((-1, 1)\), the probability that a valid correlation matrix is constructed decreases dramatically as \( n \) increases. For \( 3 \times 3 \) matrices, the subset of the unit cube consisting of valid correlation matrices can be visualized geometrically as a peculiar shape with volume \( \pi^2/2 \). In this talk, we utilize a spherical form of the Cholesky decomposition to derive a general formula for volumes (and thus probabilities) of correlation matrices in higher dimensions. (Received September 11, 2014)