

**MOMENT INEQUALITIES, MEAN INEQUALITIES, MATRIX
INEQUALITIES AND PROBABILITY INEQUALITIES**

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ABSTRACT. A number of inequalities lend themselves to alternative interpretations. For example, the fundamental Cauchy-Bunyakovsky-Schwarz inequality can be interpreted as a correlation, and also as a cosine. Similarly, quadratic forms can be interpreted as moments. These alternative interpretations often permit very different proofs, some of which are elegant. Probabilistic interpretations have an intuitive appeal, in part because it may be easier to determine when equality is achieved. Indeed, in many cases a two point distribution is the one that achieves equality. There is also an interesting, and very fruitful, connection between Schur-convexity and moments that generates a variety of inequalities. Inequalities for the gamma function exhibit this connection.