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**Title:** Matrix norm characterizations of certain operators and operator spaces

**Abstract:** We use some new 2 by 1 and 2 by 2 matrix tricks to characterize unitaries, isometries, unital operator spaces, operator systems,  $C^*$ -algebras, and related objects. There are known several characterizations of these objects in the literature, however unlike some of these other characterizations, our characterizations only use the vector space structure and the (matrix) norms, in the spirit of Ruan's matrix norm characterization of operator spaces. In particular, they do not mention maps or functionals on the space. This is a joint work with Matthew Neal.