Matrix Factorizations are Unique only up to an Invertible Transformation

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August 31, 2005

Here we simply note a trivial observation. Let $X$ be a matrix. Let $U, V$ be a factorization of $X$,

$$UV^T = X. \tag{1}$$

Let $A$ be any invertible matrix (of the appropriate size). Then, $UA, VA^{-1}$ is also a factorization of $X$,

$$(UA)(VA^{-1})^T = UAA^{-1}V^T = UV^T = X. \tag{2}$$