Jon Lee* (jonxlee@umich.edu). On sparse (reflexive) generalized inverses.

We study sparse generalized inverses $H$ of a rank-$r$ real matrix $A$. We give a “block construction” for reflexive generalized inverses having at most $r^2$ nonzeros. When $r = 1$, we demonstrate how minimizing the (vector) 1-norm of $H$ among generalized inverses can be achieved by a particular reflexive generalized inverse following our block construction. When $r = 2$ and $A$ is equivalent to a nonnegative matrix by signing rows and columns, we again demonstrate how minimizing the (vector) 1-norm of $H$ among generalized inverses can be achieved by a particular reflexive generalized inverse following our block construction. Finally, for general $r$, we demonstrate how to efficiently find a reflexive generalized inverse following our block construction that is within approximately a factor of $r^2$ of the (vector) 1-norm of the generalized inverse having minimum (vector) 1-norm. This is joint work with Marcia Fampa (UFRJ). (Received September 04, 2018)