1145-49-2007 **Babhru Joshi*** (`babhru.joshi@rice.edu`), **Paul Hand**, **Ali Ahmed** and **Alireza Aghasi**. *A convex program for bilinear inversion of sparse vectors.*

We consider the bilinear inverse problem of recovering two vectors, $\boldsymbol{x} \in \mathbb{R}^L$ and $\boldsymbol{w} \in \mathbb{R}^L$, from their entrywise product. We consider the case where $\boldsymbol{x}$ and $\boldsymbol{w}$ have known signs and are sparse with respect to known dictionaries of size K and N, respectively. Here, K and N may be larger than, smaller than, or equal to L. We introduce ℓ_1-BranchHull, which is a convex program posed in the natural parameter space and does not require an approximate solution or initialization in order to be stated or solved. We study the case where $\boldsymbol{x}$ and $\boldsymbol{w}$ are S_1- and S_2 -sparse with respect to a random dictionary and present a recovery guarantee that only depends on the number of measurements as $L \geq \Omega(S_1 + S_2)\log^2(K + N)$. We also introduce a variant of ℓ_1-BranchHull for the purpose of tolerating noise and outliers and show it can recover piecewise constant behavior from real images. (Received September 24, 2018)