

Closed form for distributed SDCA updates

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Option I at the Routine **IncDual**(w, scl):

For Hinge Loss:

$$\Delta \alpha_{k,i} = y_{k,i} \max(0, \min(1, \frac{1 - x_{k,i}^\top w^{t-1} y_i}{scl \|x_{k,i}\|^2 / \lambda n} + \alpha_{k,i}^{t-1} y_{k,i})) - \alpha_{k,i}^{t-1}$$

The choice of g in the procedure **SDCA-mR**:

$$g(w) = \frac{1}{2} \|w\|^2,$$

We may not need to consider a general g . g being a quadratic function is actually the same with the original SDCA paper (Shai Shalev-Shwartz and Tong Zhang).