Nov_09

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Deriving ADMM updates

The scaled augmented Lagrangian is:

$$argmin_r L(r, z, u) = argmin_r \frac{1}{n} \sum \phi(x_i) - y_i x_i + \lambda ||z||_1 + \frac{p}{2} ||D * \log(r) - z + u||_2^2 - \frac{p}{2} ||u||_2^2$$

Treating the constraints as $z = D * log(r)$

The updating steps are:

$r^{t+1} = argmin_r \frac{1}{n} \sum_{i=1} \phi(x_i) - y_i x_i + \frac{p}{2} ||D * \log(r^t) - z^t + u^t||_2^2$

$u^{t+1} = argmin_u \lambda ||u^t||_1^1 + + \frac{p}{2} ||D * \log(r^{t+1}) - z^t + u^t||_2^2$

$z^{t+1} = z^t + u^{t+1} - D * log(r^{t+1})$