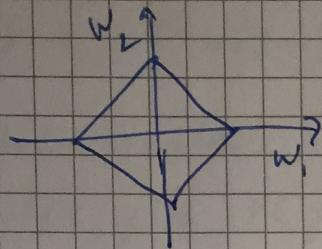


CS4780 L17 Regularization

L1 ball



Induces sparsity

Problem: Not strictly convex
so when 2 features have
same importance, any
values of w_1, w_2 give
exactly same solution causing
interceptonphenomenon

Elasticnet: $\lambda \|w\|_1 + \frac{1}{2} \|w\|_2^2$ combines both L1 & L2

$$\|w\|_1 = \sum_i |w_i|$$

Lasso: square loss with L1 regularizer only

$$+ \sum_i (w^T x_i - y_i)^2 + \lambda \|w\|_1$$