



THE UNIVERSITY OF
CHICAGO

DEPARTMENT OF STATISTICS

MASTER'S THESIS PRESENTATION

SANSEN WEI

Department of Statistics
The University of Chicago

Structured Sparsity Via the Generalized Elastic Net

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Zoom Meeting

ABSTRACT

We propose a novel $l_1 + l_2$ penalty, which we refer to as the Generalized Elastic Net, for linear regression problems where the feature vectors are indexed by vertices of a given graph and the true signal is believed to be of structured sparsity. Specifically, the signal is smooth or piecewise constant with respect to this graph. The Generalized Elastic Net is useful in the high-dimensional setting where features are correlated and the number of vertices (features) p is much larger than the number of observations n . We compare the performance of this estimator to existing regularized estimators on both synthetic and real datasets. We also present three algorithms for solving this estimator: a Coordinate Descent method (CD), an Alternating Direction Method of Multipliers (ADMM), and an Interior Point method (IP). The computational efficiency of the algorithms is analyzed empirically on synthetic datasets.