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**Ioannis Ch Paschalidis\***, Dept. of Electrical & Computer Eng., Boston University, 8 Saint Mary's St, Boston, MA 02215, and **Ruidi Chen**. *Robust Regression under the Wasserstein Metric*.

We present a Distributionally Robust Optimization (DRO) approach to linear regression, where the closeness of probability distributions is measured by the Wasserstein metric. Training data contaminated with outliers skew the regression plane computed by least squares and lead to inaccurate predictions. Classical approaches remedy this problem by downweighting the contribution of atypical data points. In contrast, our DRO approach hedges against a family of distributions that are close to the empirical distribution. We show that the resulting formulation encompasses a class of models, including the regularized Least Absolute Deviation (LAD). We provide new insights into the regularization term and give guidance on the selection of the regularization coefficient from the standpoint of a confidence region. We establish two types of performance guarantees for the solution to our formulation under mild conditions. One is related to its out-of-sample behavior, and the other concerns the discrepancy between the estimated and true regression planes. We consider applications to outlier detection and through extensive numerical results demonstrate the superiority of our approach to various alternatives in terms of estimation accuracy and outlier detection rates. (Received February 20, 2018)