

1153-62-527

**James Sharpnack\*** ([jsharpna@ucdavis.edu](mailto:jsharpna@ucdavis.edu)). *Nearest neighbor methods for locally adaptive regression, multiple imputation, and transfer learning*. Preliminary report.

We will outline three new uses of nearest neighbors: locally adaptive regression, multiple imputation, and transfer learning. The fused lasso is a locally adaptive nonparametric regressor that is used for time series and spatio-temporal grids. First, we extend the fused lasso to point cloud data using nearest neighbors graphs. We demonstrate theoretically and empirically that this method can adapt to manifold structure in the data and to local smoothness of the regression function. Second, we study multiple imputation with nearest neighbors and show that moments computed from this simple heuristic are consistent for missing at random data. This result hinges on a result that shows that the 1-nearest neighbor (1NN) measure is consistent as an empirical measure. Third, we study implications of the consistency of the 1NN measure for transfer learning, a prediction setting where the training and test distributions differ. By replacing the empirical risk with the 1NN measure of the loss, we can adapt any penalized empirical risk minimizer under covariate shift. (Received September 04, 2019)