

# A SMOOTHED MONOTONIC REGRESSION VIA L2 REGULARIZATION

OLEG SYSOEV

*Linköping University , Sweden*

## ABSTRACT:

Monotonic Regression (MR) is a standard method for extracting a monotone function from non-monotonic data, and it is used in many applications. However, a known drawback of this method is that its fitted response is a piecewise constant function, while practical response functions are often required to be continuous. The method proposed in this paper achieves monotonicity and smoothness of the regression by introducing an L2 regularization term, and it is shown that the complexity of this method is  $O(n^2)$ . In addition, our simulations demonstrate that the proposed method normally has higher predictive power than some commonly used alternative methods, such as monotonic kernel smoothers. In contrast to these methods, our approach is probabilistically motivated and has connections to Bayesian modeling.