1041-41-69 **Kirill A. Kopotun*** (kirill_kopotun@umanitoba.ca), Department of Mathematics, University of Manitoba, Winnipeg, MB R3T 2N2, Canada. *Constrained Spline Smoothing and Applications.*

Several results on constrained spline smoothing will be discussed. In particular, we establish a general result, showing how one can constructively smooth any monotone or convex piecewise polynomial function (ppf) (or any q-monotone ppf, $q \geq 3$, with one additional degree of smoothness) to be of minimal defect while keeping it close to the original function in the $\mathbb{L}_p$-(quasi)norm.

It is well known that approximating a function by ppf's of minimal defect (splines) avoids introduction of artifacts which may be unrelated to the original function, thus it is always preferable. On the other hand, it is usually easier to construct constrained ppf's with as little requirements on smoothness as possible.

Our results allow to obtain shape-preserving splines of minimal defect with equidistant or Chebyshev knots. The validity of the corresponding Jackson-type estimates for shape-preserving spline approximation is summarized, in particular we show, that the $\mathbb{L}_p$-estimates, $p \geq 1$, can be immediately derived from the $\mathbb{L}_\infty$-estimates.

Several applications will also be discussed.

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