Magnus Johansson och Kristoffer Sahlin: Splines: A theoretical and computational study

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Sammanfattning

The purpose of this paper is to fit a curve $f(x)$ to a set of points

$$(X_1, Y_1), \ldots, (X_n, Y_n).$$

We want this function to be such that the error $f(X_1) - Y_1$ is small, but at the same time we want $f(x)$ to be reasonably smooth. We will do this by considering smoothing splines, which are minimizers of a particular functional. An interpolation constant called λ, that is included within the functional, captures the trade-off between smoothness and interpolation (the deviation of $f(x)$ from the points). We will use simple theory of optimization in vector spaces to derive this function $f(x)$. We will also show an example on how the behaviour $f(x)$ will vary depending on the choice of λ.