

APPLICATION OF SPLINE APPROXIMATION METHOD TO OBTAIN LOCALLY MINIMAL APPROXIMATE TRIM LOSS FOR ONE-DIMENSIONAL CUTTING STOCK PROBLEM (1D-CSP)

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ABSTRACT

Considering first and Second order weighted means of order lengths and demand, sustainable trims of order one (t_s^1) and two (t_s^2) have been already defined. A cutting plan proposed in earlier work covers the most important component of cost minimizing problem concerning space constraint, manpower management and in particular, trim loss. In the present paper, considering a set of several datas, we have computed the sustainable trims of order one (t_s^1) and two (t_s^2) corresponding to each set of data. Considering the average order length as knots on the interval of the domain we have constructed a linear spline corresponding to the total trim loss obtained. Similarly, considering (t_s^1) and (t_s^2) as nodal points respectively on the interval of the domain linear spline functions have been constructed. It is very interesting to note that for given any arbitrary set of data, we can immediately predict the total trim loss with the help of spline curves. The authors of this paper are pioneer to implement the idea of spline approximation in the field of 1D-CSP.

KEYWORDS: First Order Sustainable Trim, Second Order Sustainable Trim, 1D-CSP, Non-Negative Integral Valued (NIV) Linear Combination, Hat Function, Linear Splines