The Violin Surface Fitting

Arun K. Mitra
Department of Mathematics and Statistics
Texas Tech University
Lubbock, Texas 79409

Simple least square models for the violin arcs (for the flat boundary and the curved surface of the top and back plates) in terms of polynomials and rational functions in rectangular coordinates have been suggested. The coefficients appearing in theses functions are obtained as the solutions of the associated linear system generated by fitting no more than five data points. The graphs of these equations for the central longitudinal arcs and several lateral arcs for both the top and back plates are presented. It appears that, with some modifications, one can obtain the equation of the surface of a violin plate. The aim here is to produce the exact equation, add the appropriate thickness and study the vibrational properties of free violin plates.