

VISUALIZING PARAMETRIC SOLUTION SETS *

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Abstract

We characterize the boundary $\partial\Sigma^p$ of the solution set Σ^p of a parametric linear system $A(p)x = b(p)$ where the elements of the $n \times n$ matrix and the right-hand side vector depend on a number of parameters p varying within interval bounds. The characterization of $\partial\Sigma^p$ is by means of pieces of parametric hypersurfaces, the latter represented by their coordinate functions depending on corresponding subsets of $n - 1$ parameters. The presented approach has a direct application for efficient visualization of parametric solution sets by utilizing some plotting functions supported by *Mathematica* and Maple. Several practical examples demonstrate the application of the developed theory and its efficiency as an unique methodology for visualizing projections of parametric solution sets of higher dimensions and depending on many uncertain parameters.

AMS subject classification (2000): 15A06, 65G99, 65S05, 68U05.

Key words: Linear systems with dependent data, interval uncertainties, parametric solution set, visualization.

*Received November 2 2006. Accepted in revised form October 19 2007. Communicated by Lars Eld'en.

†This work was partially supported by DFG and the Bulgarian National Science Fund under grant No. MM-1301.