

## The necessity of optimal design for parallel machines and a possible certified methodology

J-P. Merlet  
INRIA Sophia-Antipolis, France

*Abstract:* Although they have many advantages in term of positioning accuracy, stiffness, load capacity parallel machines have also a main drawback: their performances are very sensitive to their dimensioning. Hence although the choice of a given mechanical structure among the numerous possibilities that are offered for parallel machines may influence the performances of the machine the rule of thumb is: a mechanically appropriate but poorly dimensioned machine will present in general largely lower performances than a well designed machine with a mechanical architecture a priori less adequate.

Optimal dimensioning of a parallel machine is hence a critical issue but also a complex one, especially if uncertainties in the manufacturing are taken into account. We will present a possible design methodology based on interval analysis and will illustrate this methodology on realistic examples.