

AN INITIATIVE FOR THE KINEMATIC STUDY OF PARALLEL MANIPULATORS

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Although it has been largely demonstrated in specific applications that parallel manipulators offer very good performance, there are still domains (e.g. the machine-tool industry) in which this type of structure is not yet completely accepted. This may be explained by two main reasons:

- At the end-user level the intrinsic non-linearity of these structures is still not well understood and previous works on the subject have been overlooked. This has led to the development of prototypes whose performance was not as expected, which in turn has led to negative opinions among some communities.
- At the academic level there are still many open problems, even at the most basic levels. A direct consequence is that there is still no simulation tool that allows one to efficiently design parallel structures of arbitrary topology, although this is a key issue as the performances of these structures are highly dependent on the topology and dimensioning of the mechanism.

We will review the main problems that still need to be solved in the field of kinematics for parallel mechanisms, focusing especially on the optimal design problem, and try to outline possible approaches to solve this problem, the purpose being to clearly separate what part of the problem is architecture dependent from what may be dealt with by generic tools.