Guaranteed Detection of the Singularities of 3R Robotic Manipulators

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Résumé en anglais	The design of new manipulators requires the knowledge of their kinematic behaviour. Important kinematic properties can be characterized by the determination of certain points of interest. Important points of interest are cusps and nodes, which are special singular points responsible for the non-singular posture changing ability and for the existence of voids in the workspace, respectively. In practice, numerical errors should be properly tackled when calculating these points. This paper proposes an interval analysis based approach for the design of a numerical algorithm that finds enclosures of points of interest in the workspace and joint space of the studied robot. The algorithm is applied on 3R manipulators with mutually orthogonal joint axes.
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