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## Kinematic Geometric Modeling for Free-form Motion Generation

By Trujillo Suárez, Carlos Andrés

Condition: New. Publisher/Verlag: LAP Lambert Academic Publishing | Motion Design and Analysis | This work presents new approaches for motion design and analysis suitable for the integration of Computer Aided Design (CAD), Computer Aided Manufacturing (CAM) and Computerized Numerical Control (CNC). Therefore, not only shape but also kinematic information is conveyed in an efficient manner that can be easily implemented in CAD/CAM systems and eventually interpreted by CNC manufacturing equipment. By using dual quaternions, quaternions and planar quaternions, the displacements of a rigid body in Cartesian space are mapped into points in the image space of displacements, transforming the kinematic problem of motion interpolation into a geometric problem where the powerful techniques for curve and surface interpolation from Computer Aided Geometric Design (CAGD) can be readily applied. Three techniques are developed using quaternion biars, a four point interpolatory subdivision scheme and its tensor product version. A preliminary approach for mechanism simulation using subdivision schemes is also attempted. The results obtained have applications in CNC tool path generation, robot path planning, and computer animation. | Format: Paperback | Language/Sprache: english | 96 pp.



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