

Inverse Kinematics Computation in Computer Graphics and Robotics Using Conformal Geometric Algebra

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Abstract. We focus on inverse kinematics applications in computer graphics and robotics based on **Conformal Geometric Algebra**. Here, geometric objects like spheres and circles that are often needed in inverse kinematics algorithms are simply represented by algebraic objects.

We present algorithms for the inverse kinematics of a human arm like kinematic chain and for the grasping of robots and virtual humans. The main benefits of using geometric algebra in the virtual reality software Avalon are the easy, compact and geometrically intuitive formulation of the algorithms and the immediate computation of quaternions.

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