Diplomarbeit / Studienarbeit

Conformal Geometric Algebra for kinematic Calculations on cable-driven Robots

Cable-driven robots are parallel kinematic systems that use flexible cables instead of rigid connecting elements. This allows large workspace to be covered at high speeds. At the Chair of Dynamics and Mechanism Design a redundant robot with more cables than degrees of freedom is being developed as part of the Ropebot project.

Part of the robot control are kinematic calculations. Typically, the pose of the platform is to be determined with the help of the cable lengths. The goal of this work is to implement the kinematic calculations using Conformal Geometric Algebra (CGA).

Possible tasks are:
- Implementation of inverse kinematics (pose → cable lengths) with KGA
- Investigation of the applicability of KGA for forward kinematics (pose rope lengths)
- Software technical implementation in C++ or Python

Contact

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