

Motion Control of a Morphing Truss

Development of a Control and Drive System for Shape-Changing Truss Structures

Robot Systems Group

Laboratory for Product Development and Lightweight Design

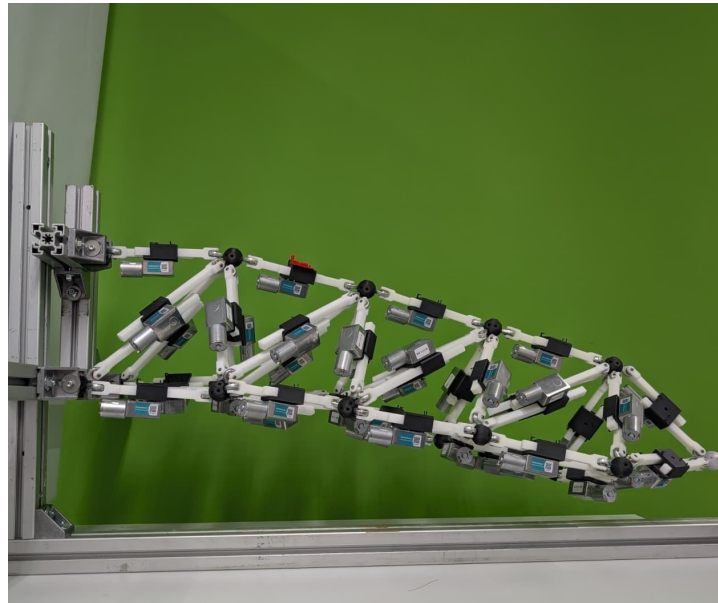


Figure 1 Morphing Truss Hardware

Project Description: The aim of this student research project is to develop a control system and motor control strategy for a morphing truss structure. The morphing truss consists of adjustable members whose lengths can be actively changed to alter the overall geometry and shape of the structure.

The student will design and implement a closed-loop control system that coordinates the actuators responsible for changing the lengths of the truss members. This includes the development of motor control algorithms, position feedback integration, and trajectory planning to achieve accurate and stable structural transformations. The project combines concepts from control engineering, mechatronics, and robotics, with the goal of enabling reliable and efficient shape adaptation of the morphing truss.

Desired Skills: Students should have a background in control engineering, mechatronics, electrical engineering, or a related field. Experience with Arduino programming and embedded software development is highly desirable. The project involves the implementation of distributed motor controllers interconnected via an RS485 communication bus, requiring an understanding of serial communication systems and real-time control. Knowledge of feedback control, actuator systems, and sensor integration will be beneficial. Experience with simulation and controller design tools such as MATLAB/Simulink is considered an advantage.

Application Process: Interested candidates should submit their application via email, including a detailed CV and a current transcript of records. Please send your applications to the Email mentioned below.

We look forward to reviewing your background and discussing how you can contribute to this innovative project.

Contact

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