Soft and oscillation-free robot arm positioning controller for series elastic tendon-driven robots by using on body gyro sensor and electromagnetic brakes

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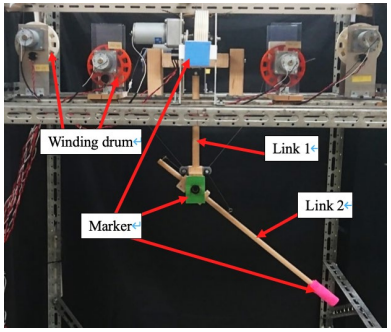
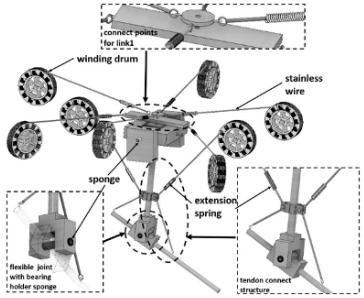
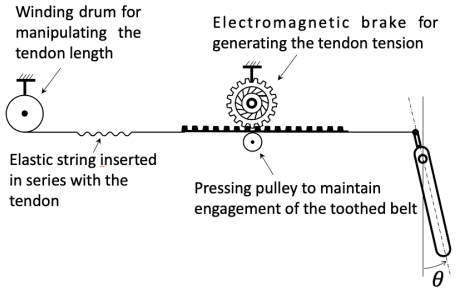
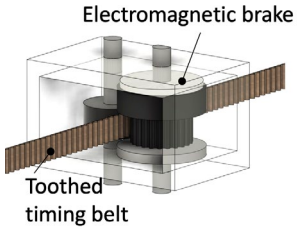




A soft robot joint was made using a rubber bearing holder. Elastic tendon drive method enables simple joint mechanism without motors, reductions, and encoders.





Kinematics without using joint angles is useful when controlling this type of soft robot, because the joint angles are not strictly determined due to the swing motion of the joint axis.

Content:

◯ This project aims for a soft robot with elastic joints by avoiding use of rigid shaft and bearings.

◯ Elastic tendon driving method allows simple mechanism of joints. (motors, reductions, and encoders are not installed in the joints)

◯ As the axis of the joint shafts cannot be strictly defined motion of the robot can not be expressed well by using the joint angles. Our challenge is a kinematics that does not use joint angles.

Appealing point:

◯ One of the goals is a disposable and on site customizable robot arm by using low cost materials.

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