

Model-based fractional order control of soft robots

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This talk addresses the application of model-based robust fractional order controllers to real robotic systems manufactured from soft materials. Instead of using rigorous models to describe the complex dynamics of these soft robots, the neglected dynamics and possible parameter mismatches are handled by these controllers. Based on fractional calculus, which implies the generalization of the derivative and integral operators to those of non-integer (fractional) order, fractional order controllers allow the implementation of robust control schemes with a straightforward mathematical definition. These controllers provide a robust performance of the system due to their superior flexibility, often outperforming their integer counterparts.