



## **ROBOT-ASSISTED THERAPY: DESIGN, CONTROL AND OPTIMIZATION**

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*Abstract- To improve the human arm function of disable patients after stroke, we propose in this paper a new design of a robot-assisted therapy. The robotic device must be attached to a human arm and mimics the motion of the shoulder, elbow and wrist joints. The functional training of the stroked upper limb is covered in motion and force via a safe compliant motion. The controller parameters are optimized by the therapist based on the human morphology parameters via an intelligent Control Interface where a Therapist-Patient Interface including the training mode configuration and the displaying the training data must motivate the patients during the assessment treatment progress.*

**Index terms:** Robot-assisted therapy, Impedance control, Safe control, Nonlinear optimization, Human Machine Interface.