AWARD CEREMONY

2017

ANTAL BEJCZY STUDENT PUBLICATION PRIZE

József Kuti, Péter Galambos, Péter Baranyi:

Minimal Volume Simplex (MVS) Polytopic Model Generation and Manipulation Methodology for TP Model Transformation

"The remote controlled robot arm is only one of the topics investigated by Antal Bejczy where the nonlinearity and outer parameter dependency (as the inertia properties of the moved object) cause serious challenges during control design (see his book ,,Robot arm dynamics and control" 1974).

My submitted paper considers this kind of systems in general: The control of so called (quasi-)Linear Parameter Varying models, where the parameters can represent the nonlinearity of the system and its dependency from outer parameters as well. The paper proposes geometrical methods to obtain polytopic models even for complex models in order to apply Linear Matrix Inequality-based control criteria, that can be solved via convex optimisation solvers (e.g. stable, LQ/H2/Hinf optimal, robust state feedback, etc.) The paper shows that the (higher dimensional) geometrical properties of the model can limit the achievable control performance properties and that the proposed methods can systematically decrease this conservativeness."