PARAMETER OPTIMIZATION FOR EXTREMUM SEEKING CONTROL OF ANTILOCK BRAKING SYSTEM

Abstract:
This paper presents a parameter tuned Extremum Seeking Control (ESC) which is utilized for control of antilock breaking system (ABS). Extremum seeking control (ESC) is a purely based on output feedback without the need for a plant model. However, the design challenge of ESC lies in deciding the values of the amplitude of the perturbation signal, the frequency of the perturbation signal, the cut-off frequency of the high-pass filter, the cut-off frequency of the low-pass filter and the integrator gain. In the present paper, the filter parameters are optimized based on the well-known meta-heuristic optimization algorithms such as Jaya Algorithm (JA), Genetic Algorithm (GA), Sine-Cosine Optimization Algorithm (SCA) and Particle Swarm Optimization Algorithm (PSO). The designed ESC controllers are applied to control of antilock breaking system for possible performance comparisons.

Keywords:
Extremum Seeking Control, Optimization, Antilock Braking System, Metaheuristics

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