Abstract

A Big Bang-Big Crunch Optimization Algorithm (BBBCOA) is availed in the design of PID controller. A sixth order system is reckoned and is scaled down to second order with the help of BB-BCOA, Particle Swarm Optimization (PSO), Genetic Algorithm (GA) Hankel Norm Approximation (HNA). Later, a controller is designed by approximate model matching technique in the Pade sense. The procedure followed is justified by the step responses of the closed loop transfer functions obtained. In the indirect case, initially controller is designed for the original system under test and the overall closed loop model is reduced to third order. The concept is exemplified and the responses are seen to be comparable.
References

- Pavel Y. Tabakov, "Big Bang–Big Crunch Optimization Method in Optimum Design
of Complex Composite Laminates\textquoteright;, World Academy of Science, Engineering and Technology, 2011.

- Hakkl M. Gene; Ibrahim Eksin and Osman K. Erol,\textquoteright; Big Bang - Big Crunch Optimization Algorithm Hybridized With Local Directional Moves and Application to Target Motion Analysis Problem\textquoteright;, IEEE International Conference on Systems Man and Cybernetics (SMC), pp. 881-887, 2010.


- Boby Philip, Jayanta Pal, \textquoteright; An Evolutionary Computation Based Approach for Reduced Order Modelling of Linear Systems\textquoteright;, IEEE International Conference on Computational Intelligence and Computing Research (ICCIC), 2010, Coimbatore 28-29 Dec. 2010.


- K. Glover, \textquoteright; All optimal Hankel-norm approximations of linear multivariable systems and their L-error bounds\textquoteright;, Int. J. Contr. , Vol 39, no. 6,1984, pp. 1115-1193.


- S. R. Desai, and Rajendra Prasad,\textquoteright; Design of PID Controller using Particle Swarm Optimized Reduced Order Model\textquoteright;, Eighth Control Instrumentation System Conference (An International Conference) CISCON-2011, Nov 3 - 6, 2011.

- Prasad Rajendra, \textquoteright; Analysis and design of control Systems using reduced order models\textquoteright;, Ph. D Thesis, University of Roorkee, Roorkee, India,1989

**Index Terms**

- Computer Science
- Hpc Applications

**Keywords**

- Model Order Reduction
- Pid Controller
- Optimization Technique.