Abstract

In this paper, an attempt has been made to tune the fractional order PID controller parameters for three interacting tank process using Bacterial Foraging Algorithm (BFA). PID controllers are tuned to satisfy three control specifications as the tunable parameters are the proportional gain, integral gain and derivative gain. The search space can be improved by the investigation of fractional order PID which involves two more parameters, the integral order and the derivative
Fractional Order PID Controller Optimized using Bacterial Foraging Technique for Three Interacting Tank Process considered as a Third Order Process

order thereby handling two additional specifications. Grunwald-Letnikov definition is used for the defining the derivative controller and Oustaloup’s filter technique is used for the approximation of the function. Tuning is complicated by the mathematical approach. The tuning is effected using BFA technique. The performance index selected is Integral Square Error (ISE). The proposed BFA tuned FOPID controller will serve as a viable controller for automating three interacting tank process.

References

- Chengbin, Ma., Hori, Y. 2004. "The application of fractional order PID controller for robust two-inertia speed control", Proceedings of the 4th International Power Electronics and Motion Control Conference, Xi’an, August.

Index Terms

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Keywords
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