GA-PID And Fuzzy Controller Applied on Grey Signal Trace Design

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ABSTRACT

Sound waves are the most direct ways to broadcast messages in nature, but due to high-tech techniques, the tracing of sound signals can come true only when lots of expenditures and human resources are used. Consequently, this article research adverts the advantages of the combination of the gray color theory and the PID controller and Fuzzy controller and Genetic Alogorithms to realize the design for sound signals to trace airts. This article is composed of three main parts. The first is to use the piezoel-electric element to make a set of four-direction sound-drawing sensor. It ’ s used to make samples from analog signal information we get, and these samples will be transformed into digital signals for the computer to analyze, compute and handle; in the mean time, we can acquire the characteristic values of signal sources. The second is to use the advantages of the gray system theory to make analyses and decisions of the characteristic values about gray relational grade, so that we can figure out sixteen-direction sound source targets. The last is to use the PID controller and Fuzzy controller and Genetic Alogorithms to make output control（motor）of the target object and the returning back of the location sensor. Finally, through serial information of the three parts ’ processes, we can get a signal-tracing system which is fast, highly accurate and disturbance-proof.

Keywords : Grey theory ; Fuzzy logic controller ; signal trace ; piezoelectric element ; Grey relational grade ; PID controller ; Genetic Alogorithms

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