

## Underwater remotely operated vehicle control system with optimized PID based on improved particle swarm optimization

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## ABSTRACT

On account of the exponential development of control theory and artificial intelligence technology in recent years, more and more control theory is applied to the control of robots, but PID control method due to the simple structure and good stability still has research value, the core and the difficulty is the optimization of PID parameters. In order to solve the underwater remotely operated vehicle (ROV) with high nonlinearity and strong coupling characteristics, it can adjust its attitude in time to ensure its control performance in the face of the disturbance of the external complex environment. By improving the particle swarm inertia weights, the particle swarm optimization (PSO) algorithm reduces the situation of falling into the local optimal solution and applies it to the PID adaptive parameterization. Comparing the improved PSO-PID with the traditional PID simulation, it is concluded that the improved PSO-PID control has certain improvement on the control performance of the ROV, which has certain feasibility.

Keywords: Remotely operated vehicle; PID control; Particle swarm optimization algorithm

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