

研究、探讨

权值优化组合粒子滤波算法研究

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摘要 重采样粒子滤波算法 (Sampling Importance Resampling, SIR) 能够克服粒子群衰退现象, 但同时减少了粒子的多样性, 导致滤波性能下降甚至滤波发散。提出了一种基于权值优化组合的粒子滤波算法 (Weight Optimal Combination Particle Filter, WOCPF), 通过在重采样前对粒子权值和粒子群权值的均值进行优化组合, 减少重采样中抛弃的粒子数, 保持了粒子的多样性, 提高了算法的精度。仿真结果证明, 粒子数相同情况下, WOCPF算法性能优于SIR算法。

关键词 [粒子滤波](#) [重采样](#) [权值](#) [优化组合](#) [粒子多样性](#)

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Research on weight optimal combination particle filter algorithm

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Abstract

Sampling Importance Resampling (SIR) arithmetic can reduce the degenerate phenomenon of particles. But it leads to the loss of diversity in particles. The loss makes filter's performance worse, even makes filtering diffuse. A Weight Optimal Combination Particle Filter (WOCPF) arithmetic is developed based on linear combination of particle weights and the particle swarm average weight, which reduces the amount of abandoned particles, overcomes the loss of diversity and improves its precision. Simulation results show that on the condition of the same particle amount, WOCPF arithmetic is better than SIR arithmetic.

Key words [particle filter](#) [resampling](#) [weight](#) [optimal combination](#) [diversity among the particles](#)

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