

基于博弈论的卫星移动通信上行功率控制算法

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摘 要: 为改善卫星通信中时延信道引起的控制滞后性, 以低的卫星接收功率与低的功率控制误差为目标, 设计出新的代价函数, 以此代价函数提出一种适用于卫星移动通信系统的上行功率控制算法, 并在算法迭代过程中引入 ARIMA 链路预测模型结果作为判决准则之一. 文中分析了该代价函数较现有代价函数的优点, 并证明了该算法的纳什均衡存在性与收敛性, 并最终通过仿真验证其性能. 仿真结果表明该算法较经典算法有一定改善.

关键词: 功率控制; 卫星移动通信; 纳什均衡; 无线资源管理; CDMA

Game-theoretic power control algorithm in satellite

mobile communications

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Abstract: In order to improve the control lag caused by long delay channel in satellite communication, a new cost function is designed with low satellite receiving power and low power control error. A cost function is proposed for satellite mobile communication system. The uplink power control algorithm introduces the ARIMA link prediction model result as one of the decision criteria in the algorithm iteration process. The advantages of the cost function over the existing cost function are analyzed, and the existence and convergence of the Nash equilibrium of the algorithm are proved. Finally, the performance is verified by simulation. Simulation results show that the algorithm has some improvement over the classical algorithm.

Key words: power control; satellite mobile communication; nash game; radio resource management; CDMA

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