

博士论坛

基于Agent的空中交通系统建模与仿真研究

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收稿日期 2008-6-27 修回日期 2008-8-5 网络版发布日期 2008-10-29 接受日期

摘要 从系统特性、内在运行机制和外在行为表现等方面对空中交通系统进行了深入分析, 提出基于离散事件和连续时间相结合的混合空中交通仿真模型。该模型采用Agent技术表现实现个体微观行为的仿真, 集成个体微观行为构成系统宏观性能表现。构建了典型的空中交通系统的Agent模型: 飞机Agent和管制员Agent。最后, 通过一个起飞和落地的应用验证了基于Agent的空中交通混合仿真在模拟个体微观行为和系统宏观表现方面均具有较高的逼真度。

关键词 [Agent](#) [空中交通仿真](#) [离散事件](#) [连续时间](#) [微观行为](#) [宏观性能](#)

分类号

Researching on air traffic system using Agent-based modeling and simulation

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Abstract

Air traffic system is analyzed from the aspects of system's attributes, internal operating mechanisms and external behaviors. A hybrid air traffic simulation model described by the combination of discrete-event and continuous-time models is proposed. The simulation model uses Agent-based techniques to describe micro behaviors of the air traffic individuals, and integrates micro behaviors into dynamic macro performance in system-wide level. Typical Agent-based air traffic models such as aircraft agent and controller agent have been constructed. An arrivals and departures simulation application has validated that the Agent-based hybrid air traffic model is provided with high fidelity in micro behavior and macro performance of the system.

Key words [Agent](#) [air traffic simulation](#) [discrete-event](#) [continuous-time](#) [micro behavior](#) [macro performance](#)

DOI: 10.3778/j.issn.1002-8331.2008.31.004

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