

工程与应用

## 快速路系统密度控制器设计与参数辨识

谢劲松, 范炳全

上海理工大学 管理学院, 上海 200093

收稿日期 2008-7-29 修回日期 2009-3-24 网络版发布日期 2009-7-9 接受日期

**摘要** 车辆之间密度、车头时距的不均匀分布, 导致快速路系统效率降低。为了提高其效率, 提出了密度控制器设计方法。它能控制车辆按恰当的速度行驶, 能使快速路各段密度指数收敛于期望密度, 从而获得均匀的密度、车头时距分布。然后通过仿真实例来辨识模型参数, 结果表明当所辨识的模型参数接近1时, 系统在此控制器作用下能获得平稳的交通流。由此说明所提控制器设计能提高系统效率、指导实践。

**关键词** [快速路系统](#) [密度控制器设计](#) [均匀分布](#) [指数收敛](#) [参数辨识](#)

分类号

## Density controller design and parameter identification of freeway systems

XIE Jin-song, FAN Bing-quan

School of Management, University of Shanghai for Science and Technology, Shanghai 200093, China

### Abstract

The density and headway's non-uniformity distribution between vehicles in the freeway system caused its low efficiency. To improve the efficiency, a density controller design was put forward. It could control the vehicles' operation by appropriate speed and make each section's density exponentially converge to desired density. Uniform distribution of density and headway was obtained. The model parameters were identified by simulative examples. The simulative results demonstrate the freeway system will obtain smooth and stable traffic flow under this controller when identified parameters are approaching 1. Therefore the proposed controller can improve the system efficiency and guide practice.

**Key words** [freeway systems](#) [density controller design](#) [uniform distribution](#) [exponentially convergent](#) [parameter identification](#)

DOI: 10.3778/j.issn.1002-8331.2009.20.056

通讯作者 谢劲松 [jinsongxie@163.com](mailto:jinsongxie@163.com)

### 扩展功能

#### 本文信息

▶ [Supporting info](#)

▶ [PDF\(739KB\)](#)

▶ [\[HTML全文\]\(0KB\)](#)

▶ [参考文献](#)

#### 服务与反馈

▶ [把本文推荐给朋友](#)

▶ [加入我的书架](#)

▶ [加入引用管理器](#)

▶ [复制索引](#)

▶ [Email Alert](#)

▶ [文章反馈](#)

▶ [浏览反馈信息](#)

#### 相关信息

▶ [本刊中 包含“快速路系统”的相关文章](#)

▶ [本文作者相关文章](#)

· [谢劲松](#)

· [范炳全](#)