Transportation Research Part C: Emerging Technologies

Volume 9, Issue 6, December 2001, Pages 415-432

A real-time traffic signal control system: architecture, algorithms, and analysis â˜†

Pitu Mirchandani [a] ... Larry Head [b]

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https://doi.org/10.1016/S0968-090X(00)00047-4

Abstract

The paper discusses a real-time traffic-adaptive signal control system referred to as RHODES. The system takes as input detector data for real-time measurement of traffic flow, and â€œoptimallyâ€ controls the flow through the network. The system utilizes a control architecture that (1) decomposes the traffic control problem into several subproblems that are interconnected in an hierarchical fashion, (2) predicts traffic flows at appropriate resolution levels (individual vehicles and platoons) to enable pro-active control, (3) allows various optimization modules for solving the hierarchical subproblems, and (4) utilizes a data structure and computer/communication approaches that allow for fast solution of the subproblems, so that each decision can be downloaded in the field appropriately within the given rolling time horizon of the corresponding subproblem. The RHODES architecture, algorithms, and its analysis are presented. Laboratory test results, based on implementation of RHODES on simulation models of actual scenarios,

illustrate the effectiveness of the system.

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Keywords

Traffic controls; Traffic optimization; Real time systems; Adaptive controls

â˜† An earlier version of this manuscript was presented at TRISTAN III (Triennial Symposium on Transportation Analysis), June 17â€“23, 1998 in San Juan, Puerto Rico.

A real-time traffic signal control system: architecture, algorithms, and analysis, glissando is progressive.
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