Software Model of Hierarchical Urban Transport Control

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Abstract: Real-time adaptive control of signalled intersections is a challenging task. In our paper we will present a software framework built in MATLAB programming environment that makes it possible to conduct clean control experiments with a selected urban traffic network model.

Our software image consist of four self-contained parts: *structure description* which is a collection of MATLAB batch files describing a street network, *model implementation* where state model of an network of signalled intersections is defined, *controller implementation* that implements the controlling strategy for the network, and *parameters description*, where parameters for the model and controller are specified. It is possible to have several model and controller implementations and several different network descriptions and setups — users specify the particular structure, model, controller and parameters when starting the simulation.

This approach has the following advantages: (1) separation of data input from the model implementation, (2) class-like structure of the code, to the extent possible in MATLAB, (3) separation of data and methods, again to the extent possible in MATLAB, (4) simple API that makes it possible to easily extend the software with new model and controller implementations.