LOCATIONS OF AVI SYSTEM AND TRAVEL TIME FORECASTING

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(Abstract)

The purpose of this research is to solve several important problems of the AVI system, including the AVI site location problem, travel time forecasting, the study of reliability and accuracy of the forecasted travel time. This thesis serves as a further research toward the modeling of AVI systems in which the effects of AVI site location, AVI site density, travel time forecasting are analyzed.

The model based on the genetic algorithms was applied to AVI site location problem to solve it as a multi-objective optimization problem, thus the best locations was determined on the basis of several criteria. The model developed was tested in an assumed transportation network. The achieved CPU time in this stage of the research are promising.

MATLAB and its accompanying Neural Network Toolbox, has been applied to data obtained from San Antonio real time AVI Tag database to forecast travel time. The approach to the neural network is detailed in this paper. Two ANN models were tested in this research. The accuracy of AVI travel time forecasting was then assessed and the better model for travel time forecasting was found. Lastly, a comparison of forecasted travel time with different travel time prediction technologies was performed to serve as a reference parameter for the travel time forecasting study.