CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY

Name(s)

Swetha Kambhampati

Project Number

S1212

Project Title

Adaptive Routing for Road Traffic: Developing a System to Find the Fastest Route Considering Traffic Congestion

Abstract

Objectives/Goals

The goal of this project was to develop a system to distinguish the optimal and fastest route between two points, with respect to time, considering traffic congestion.

Methods/Materials

1. A WEB based simulated city was built by defining the nodes and the roads connecting theses nodes. Different traffic congestions on different roads were specified.

2. A Java Class was written to implement an enhanced Dijkstra's algorithm for finding the fastest path between two points, considering traffic congestion. The Java Class was compiled using Java compiler from JDK.

3. Developed a Java Server Page (JSP) using the above Java Class to display the map and the optimal route on the Web Browser.

4. All the components were tested to ensure the absense of bugs.

5. Used the system to find an optimal and fastest route for the given starting and ending points.

Results

After executing the system with various starting and destination points, the resulting routes demonstrated the success of this system in finding the most time-efficient path considering traffic congestion, with 100% accuracy.

Conclusions/Discussion

A system with full accuracy, precision, and effectiveness, that calculates the fastest route between two specified points while taking into considering road congestion, can be developed through writing a program in Java that employs Dijkstra's algorithm. This is notable in people's everday lives by making a considerable impact on the time and resources expended when undertaking a route through maximally reducing the duration of travel and its inconveniencies.

This experiment can be expanded in the future, with improved technology like GPS, to facilitate real-time routing through developing a system with a database dynamically changing in correspondance to the changing of road traffic. Also the system can be made to be accessable from PDA or Cell Phone so that people can use the system from anywhere.

Summary Statement

The experiment is about fabricating a simulated system to find the optimal route between two points with considering traffic.