Intelligent Transportation Systems

Personnel

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Sponsorship

US citizens are spending, on average, about $1,000 per year for cars, trucks, and roads. The transportation is an important infrastructure for our society. The goal of this project is to develop a technical foundation for tomorrow's transportation systems. Currently we have a number of infrastructures which are independent from each other. Examples include infrastructures for transportation, communication, finance, health care, emergency care, and others. In the next generation, these independent infrastructures will be integrated more closely with advanced information technologies. For example, highway tolls can be charged to a driver's bank account automatically with electronic toll gates connected to bank computers. If a car accident occurs, as another example, the accident can be detected by an air-bag sensor and reported automatically through wireless network to ambulance stations. The ambulance and hospital will have teleconference on the way from the scene to the hospital for a quick care.

With this project, we are working on various research topics ranging from small-scale systems to large-scale systems as well as fundamental to application oriented subprojects. Examples of small-scale subprojects are an adaptive dynamic range image acquisition chip, an array processor chip, and a time-to-collision chip. Medium-scale systems include a personal-computer-based real-time three-dimensional machine vision system, a fusion system of machine vision and radar sensors, and an image recognition system for compressed three-dimensional images without decompression. Examples of large-scale systems are a network for real-time image transfer, train control architecture, policies for intermodal systems which consists of cars, trucks, trains, airplanes, and other transportation means.

The research is being carried out at the Intelligent Transportation Research Center in MIT's Microsystems Technology Laboratories. The center is being sponsored by several member companies.