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Mobile Inspection Assistance

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Recommended Citation

MOBILE INSPECTION ASSISTANCE

THE NEED

Every bridge in the National Bridge Inventory has to be inspected at least every two years. While advanced bridge management systems are being created, deployed and used to collect data for inventories of bridges and support the systematic identification and prioritization of needs, the bridge inspectors in the field are using paper-based to support, and record the result of their inspection process. MIA which is a wearable computer system, helps bridge inspectors collect multimedia information in the field and produce the inspection report. This system allows the inspector to fill out the inspection form, access previous inspection reports, make sketches of bridge elements, take photographs and produce the inspection report via voice or pen interface.

THE TECHNOLOGY

The required level of computing support in the field made necessary the following hardware and software be developed.

The hardware system consists of: (1) a 1.25 lb. computer, consisting of a 180 MHz Cyrix Processor, a full duplex sound processing chip, a 3.2 GB rotating disk, a serial port, and a PMCIA wireless communication card supporting spread spectrum radio at 2 Mbps; (2) 6.5 " diagonal TFT color flat panel display touch interface, 640 x 480 resolution(3) a noise canceling microphone; (4) a digital camera;(5) a van based unit that provides a battery charger and a laptop to use in the wearable unit.

FIGURE 1BRIDGE INSPECTION USING MIA VIA VOICE AND PEN INTERFACE

The software of the system consists of the following components: (1) a graphical user interface that presents overlapping panels with tabs for viewing previous inspection reports, the current inspection form, the collection of sketch templates, the photo album, and the information about monitored elements;(2) a speech recognition tool that allows the user to invoke commands via speech and make comments and annotations; (3) a database for storing the information of the bridge; (4) a tool for sketching; and (5) a tool for viewing/editing photos.

FIGURE 2MIA HARDWARE

THE BENEFITS

- The greatest advantage is that this technology offers a safe, easy handle system which facilitates the work done by a Bridge Inspector, getting the work done better and faster.
- This innovative technology assures the inspector, a substantial reduce in the amount of paperwork and data entry necessary for each report.
- The wearable computers, reduce one step in the work, because using the pen and voice interface, information is transfer into a computer and avoids the transfer of information back at the office to the computer.
- Using this device the inspector can spend more time on actual inspection and less time on paperwork, thus improving the quality and efficiency of the inspection.

STATUS

The Mobile Inspection Assistance was developed by students at Carnegie Mellon University, PA in Spring Semester of 1998. This technology was demonstrated to the local Pennsylvania Department of Transportation inspectors and engineers on April 29,1998. The future plans for MIA are to perform several

full scale field tests and explore additional forms of intelligent support that might be provided on the platform.

The same technology that has been developed for MIA, which is a wearable computer; is now been used in several other industries including Construction and related areas. Right now, a company called ViA Inc, is designing and producing computers which help engineers in getting their job done. In Land Surveying for example, the ViA Inc, software program helps to stake out a site and elaborate all the calculations immediately, getting the surveying work done faster. Also, the persons in housing assessment purposes can rely on ViA and eliminate some steps in information transfer, just because they can collect data out in the field with a pen interface technology.

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ViA, Inc, Computers that fit People

REVIEWERS

Peer reviewed as an emerging construction technology

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