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What Is Road Sign Recognition and Analysis Platform?

Survey vehicle equipped with RRAP. Photo credit: KICT.

There is a quicker and more economical way to survey 160,000 road information.

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Introduction

Road Sign Recognition and Analysis Platform (RRAP) is a technology that allows the automatic collection and recognition of road sign information. It is mounted on a vehicle, gathers data on the go, and sends information to a database.

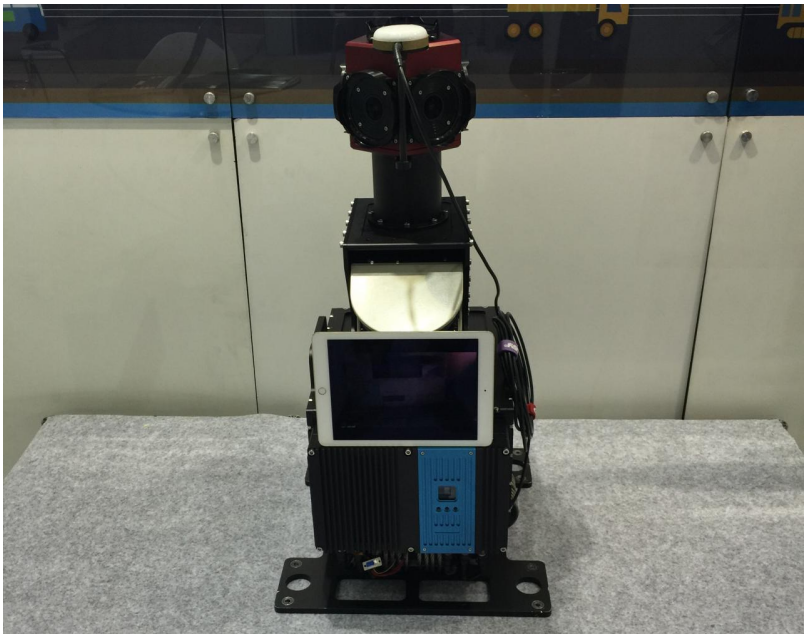
Developed by the Korea Institute of Civil Engineering and Building Technology, this platform aimed to help the government save multi-million dollars of budget allocated for manual road sign field survey and synchronization.

Traditional Road Sign Management

In the Republic of Korea, road signs are updated every year due to the construction of new roads. Currently, there are about 160,000 road signs on highways, national roads, and local roads and these are maintained by about 300 road administration offices. For the efficient management of national road signs, the government has been running its Road Sign Management System. Recording the onsite images and location information is done through field survey, then data are manually entered into the management system database.

This process proves to be inefficient as it requires a lot of manpower and budget. A nationwide onsite resurvey of all the road signs will cost the government 10 billion Korean won and another 5.2 billion Korean won for coding and analyzing the information each year.

Quick and Accurate Survey of Road Signs



The RRAP survey equipment. Photo credit: KICT.

The Road Sign Recognition and Analysis Platform technology is the economic and time efficient alternative for field survey and manual data input. It can be mounted on every vehicle with roof rails and the relevant information can be processed while the vehicle is on the road.

- First, the image information acquisition module collects visual-spatial information and extracts road sign images.
- Next, the pattern recognition module converts the road sign image to text data.
- Then, the analysis module processes attribute data of road sign, including property information of arrows, names of places by direction, and route numbers, and compares them with the existing database information.

- If the database and RRAP results match, the basic and attribute data will be integrated.
- If RRAP results do not exist in the database, new ID will be generated and added to the database.
- If RRAP results do not exist in the database because the road sign is missing, damaged, or removed, a report will be forwarded to the administrator for site confirmation.

Aside from saving millions of dollars of the national budget, this technology also ensures people's safety as it guarantees that road signs are well maintained and up to date.

Other Application

The Road Sign Recognition and Analysis Platform technology will be used for establishing traffic facilities database and visual information of various road facilities for Vworld, an open platform for 3D spatial information in South Korea being built by the Ministry of Land, Infrastructure and Transport. This will also be used to address the issues of numerous traffic signs and similar standing signboards with attributes, not only in Korea but also in other countries.

Resources

Korea Institute of Civil Engineering and Building Technology. 2017. *RRAP, A State-of-the-Art Platform for the Automatic Analysis of Road Signs.*

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Kyusoo Chong is the head of the Road Sign Management Center of Korea Institute of Civil Engineering and Construction Technology and has been leading the studies on road signs, geospatial information, photogrammetry, field survey, and big data. He is currently working on the use of multi-vehicle sensors based on big data in observing driving environment. He completed his doctoral coursework in transportation engineering at Seoul National University.

Korea Institute of Civil Engineering and Building Technology (KICT)

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