

Session

1.4.3 Enhanced Transportation Asset Data Collection Using Video Log Image Pattern Recognition

Presenter

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Visually reviewing video log images to collect transportation assets such as roadway signs is labor-intensive, time-consuming, costly, and may hinder the use of video logging for sign data collection. This paper presents the on-going research results obtained from our research project, sponsored by National Academy of Science (NAS) NCHRP Innovation Deserving Exploratory Analysis (IDEA) program, to develop new methodology and algorithms for enhancing roadway sign data collection. The developed methodology eliminates the data collection efforts by eliminating images containing no signs and by extracting sign type and legend using the developed image pattern recognition algorithm based on shape, texture, and color. By using the developed algorithms along with Distance Measurement Instrument and Global Position System (GPS), the location (milepost and x, y coordinates) of each roadway feature can be determined and store into the database automatically. They can then be plotted on the GIS map. The video log images provided by LADOTD, ConnDOT, GDOT, and Nashville were tested. Based on our test results, the developed Speed Limit Sign (SLS) recognition algorithm has demonstrated its practicality and is critically assessed using 37,640 video log images collected from the Jefferson Parish, Louisiana, and provided by LADOTD. Based on the proposed methodology, only 1,056 out of 37,640 images (2.8%) require manual process if it is assumed that the false negative rate generated by the SLS algorithm is acceptable. The actual validation by manual review of all 37,640 images indicated 0%, 3.9%, and 3.4% false negative rates for SLS data collection on interstate, non-interstate urban, and non-interstate rural roadways. The results indicate that the proposed methodology is practical and has the potential of significantly reduced the efforts and costs for processing video log images for sign data collection. This paper also discusses the future research of this new methodology.