A fuzzy logic approach for pavement section classification

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A B S T R A C T

Section classification is one of the primary challenges in any successful pavement management system. Sections are normally classified based on their pavement condition index in order to categorise as “good”, “moderate” and “poor”. Conventionally, this has been done by comparing various pavement distress data against threshold values. However, borderline values between two categories have significant influence on the subsequent pavement maintenance and rehabilitation decision. This study is the first attempt to create a system based on fuzzy logic to estimate the pavement condition index (PCI). In this paper, section data classifications are conducted using a fuzzy inference system (FIS) to utilise multiple distress data such as cracking, patching, bleeding and ravelling to develop a membership function for each defect. A FIS rule based system was then used to develop a fuzzified pavement condition index (PCI) for section classification. The result showed good agreement with the conventional PCI based pavement classification system. The proposed system has the potential to realistically differentiate pavement sections, which would aid to have economical maintenance and rehabilitation decision.