

A Review on Cracks and Patches on Road

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ABSTRACT

This paper presents a report of cracks and patches are same type of road surface distresses whose assessment is essential in India. At present, distress data collection is increasingly being automated by using various imaging system. This is expensive, time consuming and slows down the road maintenance management. A robust method of automated detection and assessment of cracks and patches from real life video clips of Indian highway is proposed. The local authority road networks commonly comprise roads of various functional characteristics and a variety of construction types. We are investigate about the use of digital technique to obtain field data to increase safety and reduce labour requirements using a semi automated distress collection and measurement system and also in the robust method cracks and patches are detected and quantified automatically using various image processing technique supported by heuristically derived decision logic. The algorithm automatically detects cracks and patches after the adjustment of the optical distortion. Moreover, the technique products an automatic classification and rating to create different categories. Patches have always been a problem for highway maintenance agencies because their repair is costly and time consuming.

Keywords: Automated Distress Assessment, Image Analysis, Distress, Automated Survey

I. INTRODUCTION

An area of pavement where part of the original pavement has been replaced or covered with new material to repair the existing pavement is called as patches. In a road maintenances management system the assessment of road surface distress is one of the important tasks for developing repair and maintenance strategies. Patches and cracks are some type of road surface distress whose assessment is essential in India (March 2004). The correct patching techniques prolong the life of the pavement and prevent further degradation which can lead to an accelerated rate of decay of the pavement. Potholes are an annoyance and a danger to the public and their patching consumes time from state department of

transportation and local department of public work agencies that could be spent elsewhere therefore correctly patching potholes. The time is extremely important to reduced long term cost associated with repeated patching. All flexible pavement require patching at sometime during their service life. Patching material are one of the larger material cost. A high quality patch is one of the most cost effective means of utilizing available resources because of surface patching patching should be perform to a standard commensurate with resource availability and the objective of retaining a smooth ride as long as possible potholes. Cracks and patches are some type of road surface distresses whose assessment is essential in India. In the current field practice road distress data assessment is reported to be done through distress data

collection and processing of the collected raw data. At present distress data collection is increasingly being automated by using various imaging systems. The collected raw video clips for distress assessment is still predominantly being done manually this is expensive, time consuming and slows down the road maintenance management. In these paper a robust method for automated detection and assessment of potholes cracks and patches are detected and quantified automatically using various image processing techniques supported by heuristically derived decision logic.

The information extracted using the proposed method can be used for determining maintenance levels of Indian road and taking further appropriate actions for repair and rehabilitation.



Figure 1. Patch work of road

The literature reviews studied are discussed below:

(Siksha Swaroopa Kar, Dr. P.K.Jain) [1]: In there paper they study the repair of cracks and patches in Many a times, potholes are repaired by non scientific antiquated techniques and non-standard materials. It is often seen on roads that potholes are filled in haste by debris/soil, which is usually washed away with the first rain. It leads to a pavement that cannot be repaired and can be made functional only by reconstruction. Therefore, scientific approach involving utilization of standard materials and

techniques is essential for long lasting repairs of potholes and patches.

(Lokeshwor Huidrom, Lalit Kumar Das, S.K.Sud) [2]:

The objective of this study is to develop a robust method which has the capability to detect and measure potholes, cracks and patches accurately from real life video frames of Indian highways having bituminous surfaces. With regard to this objective, the present study started with the personal experience of the occurrence of various forms of potholes, cracks and patches on Indian highways. The distinctive visual characteristic of these distresses such brightness, shape, size and location are further investigated to build a heuristically derived decision logic for their accurate identification and classification. Further, real life video clips of Indian highways at different places are captured using two existing camera based imaging systems and they are segmented automatically into two different types of frames category (frames with distress and frames without distress) using a fast video segmentation algorithm called DFS algorithm. Then, database of frames with distress is processed with the proposed algorithm called CDDMC algorithm for automated detection and measurement of potholes, cracks and patches in one pass.

(Sebastiano Battiato, Filippo Stanco, Salvatore Cafiso, Alessandro Di Graziano) [3] :

In there paper they introduce In the road management process, an evaluation of road pavement conditions is one of the most important aspects required to guarantee adequate functional standards and a suitable maintenance programme. An awareness of pavement conditions is necessary in order to be able to programme short, medium and long-term maintenance works within a systematic management system (Pavement Management System, PMS) which permits available resources to be optimised,2 guaranteeing that functional standards and preestablished safety standards are always met.6 The importance of road network management supported by the

implementation of a PMS is a concept that is currently accepted by nearly all those countries which invest resources, not so much into the building of new roads, as into research to maintain existing pavements in good condition.⁸ However, many local authorities are worrying slow in implementing decision support systems for an optimised road network management also because there is often a lack of information regarding the managed network due to its extent and the high cost of surveying its condition.

(**Matthew Sainz**) [4] : In there paper they shows the summary of potholes. The pothles are typically caused by traffic stresses, poor underlying support, the presence of moisture, and freeze-thaw cycles. Asphalt pavement maintenance can be categorized as preventive maintenance, corrective maintenance, or emergency maintenance. Preventive maintenance is used to extend the life of a pavement before catastrophic distresses occur. Corrective, or reactive maintenance, is performed after “a deficiency occurs in the pavement, such as loss of friction, moderate to severe rutting, or extensive cracking” takes place (Johnson and Snopl 2000). Emergency maintenance is performed after a serious or dangerous failure has happened to the asphalt pavement, such as a blowout or large pothole. The four most commonly used techniques for pothole patching are throw-and-go, throw and-roll, semi-permanent, and spray-injection and the costs associated with each type of pothole patching can be broken into materials, labor and equipment. Patching can take place during the spring period, when the base material is soft and wet and there are few, if any, freeze-thaw cycles expected, or during the winter period, when potholes are typically formed and the temperatures are low, the base material is frozen, and additional moisture and freeze-thaw cycles are expected. (Wilson and Romine 1994). Because of the better weather conditions and reduced stresses, patches applied in the spring have a much longer life expectancy.

(**Dax Patel, Prof.(Dr.) P.J.Gundaliya, Dr. Prakash Mehta**) [5] : In there paper they introduce that the India has the second largest road network in the world spanning about 4.69 million km comprising different categories of roads. Only half of the total road network is paved and of the paved roads, 90% of them are bituminous pavements. Pavement design is the process of developing the most economical combination of pavement layers to suit the soil foundation and the cumulative traffic to be carried during the design life. Pavement design consists of mainly two parts: (i) Design of the material mixture, to be used in each pavement component layer; (ii) design of pavement structure (design of thickness and type of different component layers). The main factors to be considered in the pavement design are: traffic; climate, road geometry; and position, soil and drainage. Highway pavement is deteriorating fast due to lack of timely maintenance Thus, timely maintenance of the highway pavement is essential. Road maintenance is one of the important components of the entire road system. Right maintenance treatment is to be given to the right place at the right time. A flexible pavement failure is defined by formation of pot holes, ruts, cracks, localized depressions, settlements, etc

II. DISCUSSION

All paragraphs must be indented. All paragraphs must The entire document should be in Times New Roman or Times font. Type 3 fonts must not be used. Other font types may be used if needed for special purposes.



Figure 2. patch work of road

III. CONCLUSION

Although a conclusion may review the main points of the paper, do not replicate the abstract as the conclusion. A conclusion might elaborate on the importance of the work or suggest applications and extensions. Authors are strongly encouraged not to call out multiple figures or tables in the conclusion—these should be referenced in the body of the paper.

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