



الآية

قال تعالى:

(رَبِّ أَوْزَعْنِي أَنْ أَشْكُرَ نِعْمَتَكَ الَّتِي أَنْعَمْتَ عَلَيَّ وَعَلَى
وَالِدَيَّ وَأَنْ أَعْمَلَ صَالِحًا تَرْضَاهُ وَأَدْخِلْنِي بِرَحْمَتِكَ فِي
عِبَادِكَ الصَّالِحِينَ)

صدق الله العظيم

الآية (١٩) من سورة النمل

Dedication

To those, who we can never pay them back for all they have done for us, but we can
try!

Parents...

My Mom and Dad mercy of God

Deepest thanks for your endless love, prayers, sacrifices, supports and advices

To those, who are holding our hands tightly as we dance through life

Brothers and Sisters...

Without encouraged me, I could not have finished this work

Friends and Classmates...

Thanks for all beautiful moments I shared, for supports during stressful and
difficult moments

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Abstract

Railways have advantages over the roadways that they can carry a large number of passengers and large and heavy loads to long distance. Sudan has a large network of railways through the country with total length of track about more than 4000 km.

The major accidents in the railway networks are occurs due to crack faults. If these cracks are not detected at early stages they might lead to a number of derailments resulting in a heavy loss of life. So, This study aims in designing and implement of railway crack detection system using the Arduino Uno, IR obstacle Sensor assembly system, which detects the cracks along its path, the system is also capable of monitoring the location of the crack by using the GPS module and alerts through SMS messages using GSM module.

The system with its both software and hardware sides has been tested and it performed well. Thus, considering the results that achieved it has remained projected that if the system is applied in railways it saves a lot of time compared with the traditional detection techniques hence it will preventing train accidents to very large extent.

مستخلص

لدي السكك الحديدية مزايا على طرق المواصلات الأخرى فهي يمكن أن تحمل عددا كبيرا من الركاب والحمولات الكبيرة والثقيلة لمسافات طويلة ، السودان لديه شبكة واسعة من خطوط السكة حديد عبر البلاد بطول إجمالي للمسارات حوالي أكثر من 4000 كم .

أكثر الحوادث في شبكات السكة حديد هي نتيجة وجود كسور علي المسارات الحديدية وإذا لم يتم الكشف عنها في مراحل مبكرة فقد يؤدي هذا إلى خروج القطارات عن مساراتها مما ينتج عنه خسائر فادحة في الأرواح .

تهدف هذه الدراسة إلى تصميم وتنفيذ نظام الكشف عن الكسر في مسار السكة حديد باستخدام مستشعر الأشعة تحت الحمراء الذي يعمل علي اكتشاف الكسر علي طول الطريق كما له قدره علي رصد موقع الكسر مستخدما نظام تحديد المواقع والتنبيه عبر الرسائل القصيره باستخدام النظام العالمي للاتصالات النقالة.

تم اختبار النظام بنجاح وكان ادائه جيدا ، وبالنظر الي النتائج التي تحققت فإنه من المتوقع اذا تم تطبيق النظام في السكك الحديدية سيوفر الكثير من الوقت مقارنة مع تقنيات الكشف التقليدية وبالتالي فإنه سيتم منع حوادث القطارات الي حد كبير.

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