A New Computer-based Ferromagnetic Metal Detector for Security Applications

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Authors:
Francis K. Murori, Elijah Mwangi, Patrick M. Karimi

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Abstract

The need for detecting and locating concealed metallic objects and contraband items increases in importance as the issues of security becomes of great concern. In the field of metal detectors, the research is being geared towards the production of detectors with fast settling times and high discriminating ability. This paper proposes a method for designing a computer-based ferromagnetic metal detector which can be employed for security applications. The LabVIEW software has been used to program the detector. It is a novel programming language from National Instruments that is robust, highly parallel and eliminates most of syntactical details associated with text based programming languages. Because of this, the development time of the detector is reduced by a significant factor. A recognition algorithm has also been designed to discriminate between ferromagnetic items by their mass and size. To improve the settling time of the detector, components with fast response times have been chosen, making the detector’s settling time to be approximately 1.1 sec. In addition, the screening process has been made more convenient by connecting the detector to a remote computer through data socket
networking. The remote computer enables the detector to be monitored remotely in real time and also acts as a central database where the screening information is sent for further storage.

The system hardware comprises of ten fluxgate magnetic field sensors (FLC 100) with response time of 1sec and sensitivity of 1V/50µT, a wooden frame in form of a portal, connecting cables, USB DAQ 2833, USB video camera, wireless network adapter and two laptop computers.

References

3. G.S. Burns, “In-situ vehicle classification using an ILD and a magneto resistive sensor array”, Final report, Center for Transportation Studies University of Minenesota, Duluth, United States, 2009.


Index Terms

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Keywords

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