

AUTOMATIC DETECTION OF EXPLOSIVE DEVICES IN INFRARED IMAGERY USING
TEXTURE WITH ADAPTIVE BACKGROUND MIXTURE MODELS

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ABSTRACT

Infrared cameras can be used to image unpaved roads containing buried explosive hazards where detection relies upon differences between settled and disturbed soil in addition to thermal emissivity. Used is a variation of the mixture of Gaussians (MOG) modeling technique together with a texture-based classifier to separate out potential hazards from benign background regions. Objects detected in IR-image space using MOG and texture are then projected into Universal Transverse Mercator (UTM) coordinates where they are filtered based on shape and orientation.

The MOG method has been used successfully in the past to model backgrounds in imagery taken from fixed cameras with slow changing backgrounds. The use of MOG with long wave infrared cameras mounted on a moving platform creates some unique problems whose solutions are addressed in this thesis.

Experimental results are demonstrated on data sets collected at a US Army test site.