

# 基于 FPGA 图像分析的路面破损检测系统的研究与实现

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**摘 要:** 以路面破损之一的横向裂缝为例, 提出一种基于 FPGA 图像分析的路面破损检测装置的实现方法.该装置采用 Sobel 算法, 并通过 Verilog HDL 语言编程在 FPGA 开发板上实现对输入路面图像分析和特征提取.为了提高检测准确性和抗干扰能力, 在 Sobel 方法算法中加入可変分母的差分运算, 并在图像二值化处理后进行形态学膨胀腐蚀.仿真和实验表明该检测装置能够准确检测路面裂缝.

**关键词:** 裂缝检测; Sobel 算子; 膨胀腐蚀; FPGA

## Pavement Damage Detection System Based on FPGA Image

### Analysis Research and Implementation

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**Abstract:** Based on pavement damage, one of the transverse crack as an example, put forward a kind of image analysis based on the FPGA realization method of pavement damage detection device.The device adopts the Sobel algorithm, and through the Verilog HDL language programming implementation on FPGA development board to enter the road image analysis and feature extraction.The result of the judge is dealing with the analysis of crack damage.In order to improve the detection accuracy and anti-interference ability, the method of Sobel algorithm with variable denominator difference operation, and the morphology after image binarization processing corrosion expansion.Through the simulation and experiment show that the detection device can accurately detect cracks.

**Key words:** crack detection;sobel operator;corrosion&expansion; FPGA

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