Project: IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs)

Submission Title : Performance Enhancement of Vehicular Communication using Neural Network
Date Submitted : [May, 2021]

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Abstract : This document discusses about the BER reduction technique using neural network

Purpose : In order to reduce the BER during the moving scenarios of vehicle, we have proposed a neural network based feature extraction technique for the reformation of the stripe pattern.

Introduction

✓ We develop a neural network (NN) at the receiver for accurately detecting the LED in both static and mobile conditions.

✓ In existing literature, an LED array is detected as a single LED, however, each LED of the LED array can be detected using the proposed NN technique.

✓ The NN can classify large image datasets with remarkable characteristics in several spatial layers and automatically learn from data through backpropagation. Different NNs have been presented for the detection of the LED array and to support mobility.

✓ However, they simulated the mobile scenario by moving a finger continuously, blocking the particular LEDs. The error rate was high using those methods. In our proposed scheme, we have simulated the mobile scenario by moving the camera itself and achieved an excellent BER.
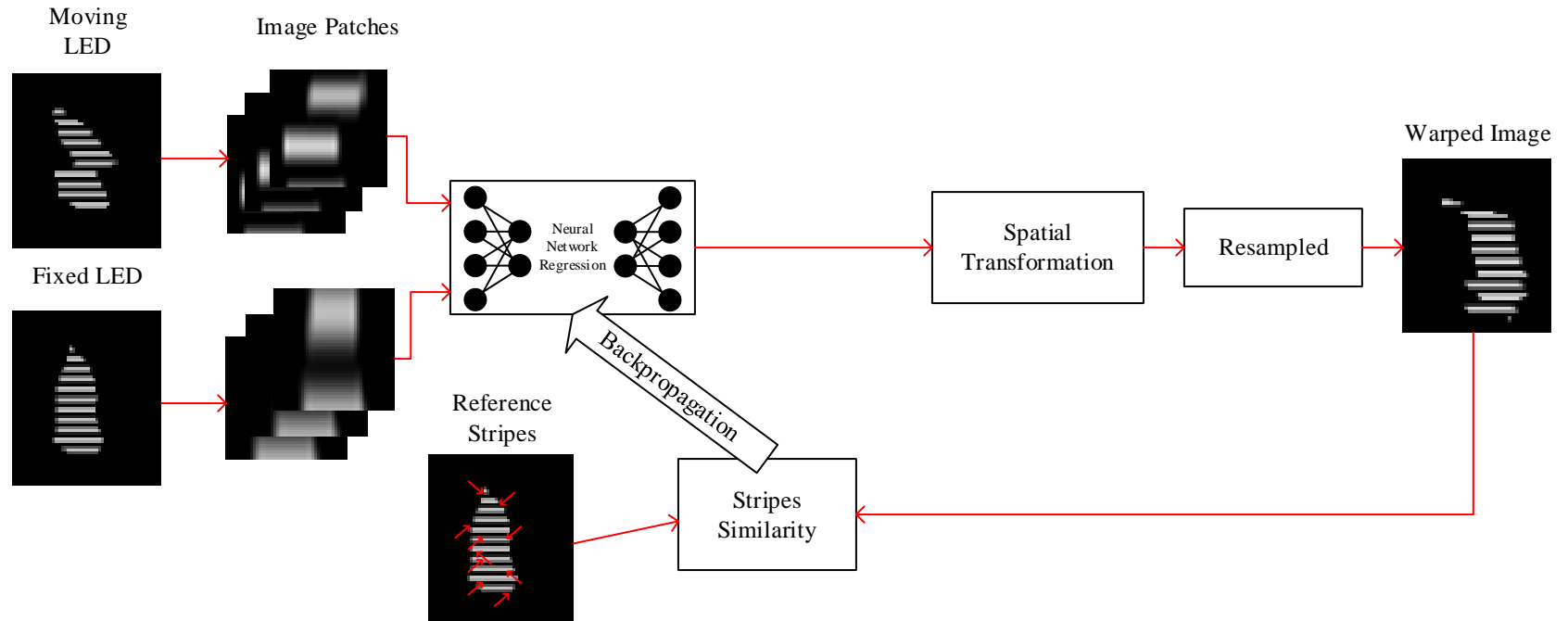
System Architecture

Figure 1: Training architecture of neural network based stripe pattern reformation.
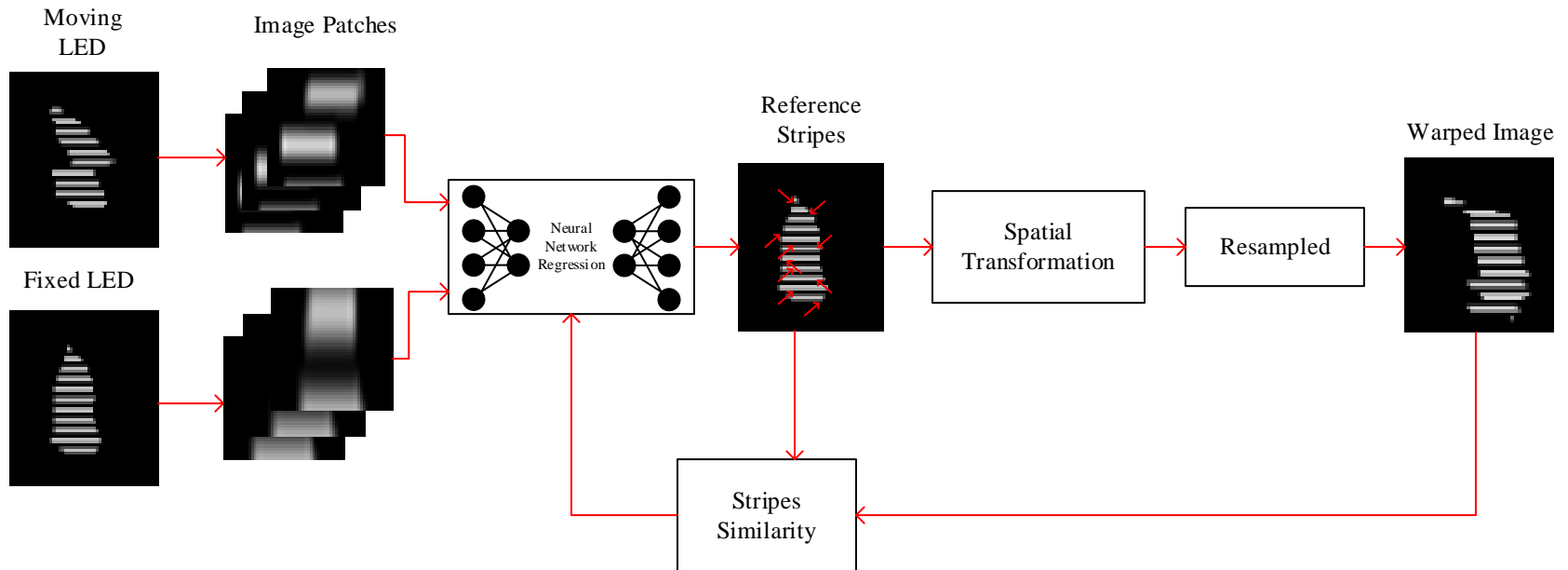
System Architecture

Figure 2: Testing architecture of stripe pattern reconstruction.

Technical considerations

- ✓ The neural network mainly operated based on the feature extraction technique of the stripe pattern.

- ✓ However, the given diagram shows the training and testing procedure and checking the similarity of each iteration.

- ✓ In every iteration the relative position of the stripe is change by checking the similarity with the reference pattern.