

Synchronization of Lines in an Image

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Abstract

This report outlines a proposed procedure for synchronising lines of an image that has been corrupted by randomly shifting horizontal lines. The method involves the use of discrete fourier transforms of each line in the given image to determine to what degree each of them was shifted. The end result of the procedure is an image that has been reconstructed to an almost perfect extent.

1 Introduction

The field of digital image processing aims to modify images through the use of mathematical operations. This is done by considering images as two dimensional objects and applying signal processing techniques to them in order to manipulate them. This work describes an algorithm used to fix images that have had certain horizontal lines randomly shifted. The algorithm receives as input a corrupted image in file format `.pgm` (Portable Graymap). The input image has to have a number of horizontal lines that have been shifted by a random number of pixels, for example fig. 1

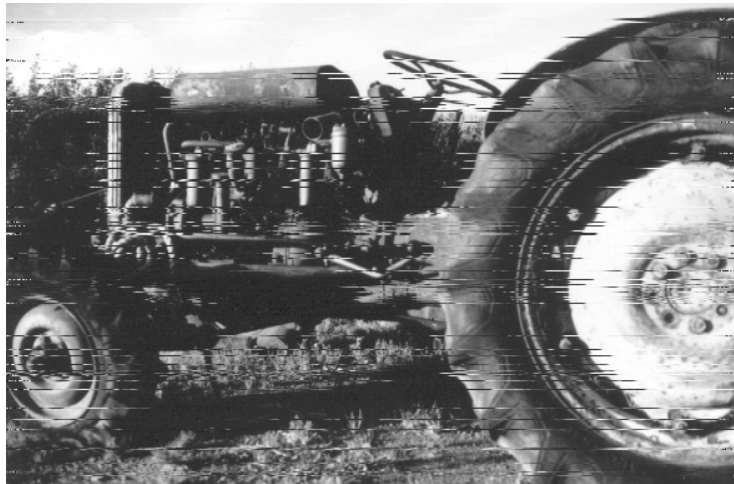


Figure 1: Randomly shifted horizontal lines.

Through the use of various mathematical methods it is possible to find the degree to which each horizontal line has been shifted. This is done through the

use of Discrete Fourier Transforms of each horizontal line. A comparison between each line and the one directly above it is performed in order to determine by how many pixels the image has been shifted.