

Author's Accepted Manuscript

Staff removal using image operator learning

Igor S. Montagner, Nina S.T. Hirata, Roberto Hirata



PII: S0031-3203(16)30318-1
DOI: <http://dx.doi.org/10.1016/j.patcog.2016.10.002>
Reference: PR5910

To appear in: *Pattern Recognition*

Received date: 26 February 2016
Revised date: 30 September 2016
Accepted date: 1 October 2016

Cite this article as: Igor S. Montagner, Nina S.T. Hirata and Roberto Hirata, Staff removal using image operator learning, *Pattern Recognition*, <http://dx.doi.org/10.1016/j.patcog.2016.10.002>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting galley proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Staff removal using image operator learning

Igor S. Montagner, Nina S. T. Hirata, Roberto Hirata Jr

*Department of Computer Science, Institute of Mathematics and Statistics, University of
São Paulo*

05508-090 — Rua do Matão, 1010 – São Paulo, Brazil

{igordsm,nina,hirata}@ime.usp.br

Abstract

Staff removal is an image processing task that aims to facilitate further analysis of music score images. Even when restricted to images in specific domains such as music score recognition, solving image processing problems usually requires the design of customized algorithms. To cope with image variabilities and the growing amount of data, machine learning based techniques emerge as a natural approach to be employed in image processing problems. In this sense, image operator learning methods are concerned with estimating, from sample pairs of input-output images of a transformation, a local function that characterizes the image transformation. These methods require the definition of some parameters, including the local information to be considered in the processing which is defined by a window. In this work we show how to apply the image operator learning technique to the staff line removal problem. We present an algorithm for window determination and show that it captures visual information relevant for staff removal. We also present a reference window set to be used in cases where the training set is not sufficiently large. Experimental results obtained with respect to synthetic and handwritten music scores under varying image conditions show that the learned image operators are comparable with especially designed state-of-the-art heuristic algorithms.

Keywords: staff removal, optical music recognition, document image analysis, image operator, machine learning

Download English Version:

<https://daneshyari.com/en/article/4969820>

Download Persian Version:

<https://daneshyari.com/article/4969820>

[Daneshyari.com](https://daneshyari.com)