

# Digital Analysis of Paintings

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*Abstract—*

## I. INTRODUCTION

Digital image processing is a field which encourages the crossover of different scientific disciplines, often biological research and computer vision align to automate the collection and analysis of plant growth. However, art and computing are fields which, at first glance, have very little in common.

But a deeper look unveils a plethora of different avenues from detecting forgeries to being able to date an artists work within a catalogue of their known pieces[1].

This survey paper will unearth some of the techniques which are used to perform such analysis and evaluate their application in real world problems.

## II. IMAGE PROCESSING

A typical digital image is represented as a matrix of pixels where each pixel contains information about the colour it represents. This colour can be described using several different representations and although each representation will equate to the same colour in the rendered image, the information stored can be radically different.

This representation of an image provides several key pieces of information, including:

- colour space of the image
- the relationship between pixels

The digital processing of images is normally done through the application of functions or filters to the matrix to gather specific information relating to the desired result. A simple example of this would be averaging the colours of an image to get a basic idea of the colours in an image.

More advanced techniques involve performing several of these operations in sequence to provide a more complex view of the image.

There are many sections of image processing, each with their different purposes this report will particularly focus on those relating to colour space; edge detection and orientation for texture analysis and segmentation and regions of interest for brush stroke analysis.

## III. COLOUR SPACE ANALYSIS

## IV. TEXTURE ANALYSIS

## V. BRUSH STROKE ANALYSIS

## VI. APPLICATION OF IMAGE PROCESSING TO ARTWORK

### A. Dating Artists Work

## VII. CONCLUSION

## REFERENCES

- [1] A. Brown, G. Roderick, H. Dee, and L. Hughes, "Can we date an artist's work from catalogue photographs?" in *Image and Signal Processing and Analysis (ISPA), 2013 8th International Symposium on*, Sept 2013, pp. 558–563.