



## Digital Receipt

This receipt acknowledges that **Turnitin** received your paper. Below you will find the receipt information regarding your submission.

The first page of your submissions is displayed below.

Submission author: **Zhiheng TANG**  
Assignment title: **Proposal**  
Submission title: **by General Office on 27 March 2020**  
File name: **FYP\_Project\_Proposal\_17083046d....**  
File size: **27.67K**  
Page count: **6**  
Word count: **1,700**  
Character count: **9,524**  
Submission date: **27-Mar-2020 07:21PM (UTC+0800)**  
Submission ID: **1283176281**

### Project Proposal of "Advanced Image Processing and Machine-learning Techniques for Film Restoration"

TANG Zhiheng

17083046D

2020/03/27

#### 1 INTRODUCTION

Before the introduction of digital media, the archived film has been the primary media of video documenting for a relatively long time. To preserve the originality of the archived film is of great importance since many of the archive films possess high historical or artistic value. In some countries, archive films are regarded as valuable heritage and an enormous amount of effort has been made in film archival and restoration.

Unlike digital media, archived films are prone to degradation due to abrasion and inappropriate storage. Repeated use of films mainly results in scratches on the screen and the degree of degradation increases each time. Inappropriate storing environment leads to dirt accumulation or chemical change of the film, where random size and shape of sparkle, blotches, and noise occurs.

Traditional restoration approaches aim to analyze the degradation process and try to reverse it by physical and chemical means. Usually, the degradation process is complex and increase analyzing difficulties. Note that those procedures are also irreversible. It is under high risk due to the high uncertainty of the result.

After the transitions to digital media, historic films have been scanned and archived in digital form, which leads the restoration research to the digital field. Compared with traditional approaches, digital restoration is much more convenient for experimenting without the fear of causing any damage and a great amount of research has been conducted.

Many techniques and algorithms have been invented by academic and industry collaborations by now, which can be categorized into non-deep-learning methods and deep-learning methods. non-deep-learning methods. Non-deep-learning methods usually seek the correlation between consecutive films and detect artifacts from discontinuity. Deep-learning methods will attempt to train a deep neural network to only select undegraded pixels while artifacts are ignored.

There is also an interesting fact that different defect types can be detected and restored

