

**WALCHAND COLLEGE OF ENGINEERING, SANGLI**

(An Autonomous Institute)

Department of Computer Science and Engineering

**Image File Format Converter using Open Source Libraries**

PROJECT SYNOPSIS

OF MAJOR PROJECT

**BACHELOR OF TECHNOLOGY**

Computer Science and Engineering

**Project Guide**

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**List of Abbreviations**

**TIFF**  **T**agged **I**mage **F**ile **F**ormat

**CMYK** **C**yan, **M**agenta, **Y**ellow, **K**ey (Black)

**YCbCr** Green(**Y**), Blue (**Cb**), Red (**Cr**)

**PNG** **P**ortable **N**etwork **G**raphics

**JPEG** **J**oint **P**hotographic **E**xperts **G**roup

**GIF** **G**raphics **I**nterchange **F**ormat

**Mac** **Mac**intosh

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1. **INTRODUCTION**

Images are very important documents nowadays; to work with them in some applications they need to be compressed, more or less depending on the purpose of the application.

There are some algorithms that perform this compression in different ways; some are lossless and keep the same information as the original image, some others loss information when compressing the image. Some of these compression methods are designed for specific kinds of images, so they will not be so good for other kinds of images. Some algorithms even let you change parameters they use to adjust the compression better to the image.

There is no universal image format that is best for all scenarios. Every type of image format has its own advantages and disadvantages. Here is a summation of each image format, their pros and cons, as well as when and where it’s best to use them.

Print Graphics: TIFF is the best and only choice for professionals when images are intended for print. Its ability to read CMYK and YCbCr color, plus its ability to store such high pixel intensity makes it the only choice for designers, photographers and publishers.

Web Graphics: PNG, JPEG and GIF are the most web friendly image formats there is. JPEG is great for images when you need to keep the size small, such as when you need to upload it online. If you don’t mind compromising the quality of the image a bit, use JPEG. If you want to keep the size small, but still retain the image quality, use PNG. GIF is the worst choice, although file sizes are very small, and they load very fast. Plus, if you want to add animation effects, use GIF.

Windows& Mac Compatibility: If you are using Mac or Windows, or constantly shifting from one to another, JPEG is the best image format for Windows and Mac Compatibility.

Logos & Line Art: JPEG is the worst choice, it tends to add artifacts and blur the text, line and edges. JPEG also cannot support transparency, which is often a need for logos or icons. GIF is a good choice, but it pales in comparison to TIFF and PNG. Both of the latter image formats are lossless, store as much image information, and are not limited to 256 colors, unlike GIF. They also don’t add artifacts (the downfall of JPEG) and keep the logo or line art sharp and concise.

Clip Art: GIF is the best image for clipart and drawn graphics that only use few colors and precise lines & shapes.

There are number of cases where we need to change the file format of given image according to its applicability. Our aim with this project is to make a comparison of some of the most used image representation formats on a set of images. And to create an open source converter for some shortlisted file formats.

There are no free file format converters available for the following shortlisted file formats.

The free file format converters do not convert the complex image types like the ones mentioned below.

**File Formats:**

* **WPG** - WordPerfect Bitmap (\*.wpg)
* **CALS** - Computer Aided Acquisition and Logistics Support (\*.cal)
* **PHOTOSHOP** - Adobe Photoshop (\*.psd)
* **DIB**  - Device Independent Bitmap (\*.dib)
* **SCITEX**  - SciTex Continuous Tone (\*.sct)
* **PCX** - ZSoft Painbrush (\*.pcx)
* **DCX** - Intel Format (\*.dcx)
* **XPM** - X PixMap (\*.xpm)
* **RAST** - Sun Raster Image (\*.ras)
* **TGA** - TrueVision Targa (.\*tga)
* **IOCA**  - Image Object Content Architecture (\*.iss)

1. **Literature Survey**

Different tools/software may require same image in different formats to increase its efficiency and agility. There are many software that convert an image from one format to another. These tools come for a cost. There are no open source image file format converters available that work efficiently.

We also tested some open source image file format converters. They also work efficiently but do not support more number of file formats for conversion. Also the available open source image file format converters have been reported unstable for converting larger number of files by the users.

For example, Irfanview is the free available image format converter. It is effective but unstable, as reported [5] by different users. RasterMaster [6] is the best image conversion and viewing SDK available, but it costs $2500 + distribution licensing. Hence, it is not feasible for everybody to use it, because of the cost.

1. **Feasibility**

There are number image file format converters available which are proprietary. Few open source libraries for image file format conversion are available which are suitable for some specific file formats. The libraries for other formats need to be created. We need to collect and study available libraries. We propose an application which will be created by clubbing present open source libraries and adding newly created libraries to it. This application will be the package of number of libraries working together.

**Open Source Libraries:**

* **ImageMagick++**
* **FreeImage**

Table 1 shows the shortlisted image formats and support by the standard open source libraries mentioned above. Also both the libraries support 32 and 64 bit version of Windows operating system.

|  |  |  |
| --- | --- | --- |
|  | **FreeImage** | **ImageMagick** |
| **License Type** | http://opensource.org/licenses/  GPL-3.0 | http://www.imagemagick.org/script/  license.php |
| **Win 64 Support** | Y | Y |
| **Win 32 Support** | Y | Y |
| **WPG** | - | R |
| **CALS** | R | - |
| **PHOTOSHOP** | R | R/W |
| **DIB** | R/W | R/W |
| **SCITEX** | - | R |
| **PCX** | R | R/W |
| **DCX** | - | R/W |
| **XPM** | R/W | R/W |
| **RAST** | R | R/W |
| **TGA** | - | R/W |
| **IOCS** | - | - |

**Table 1: Representation of image formats and library support**

1. **Objectives**

* To study and list image file formats used for conversion.
* To study and use freeware libraries for the conversion of image.
* To create an application to convert image from one format to another using C++.

1. **Methodology**

This project development is divided into following sequence of working modules.

1. **Study different file formats**

This constitutes an initial stage in which basic concepts of image processing and number of image file formats available at present will be studied. The file formats can be studied under following categories.

* Vector
* Raster

1. **Prepare a generic document on file formats**

All the information collected in last stage will be documented into well-defined format. This stage has an importance as the document prepared in this stage will be referred throughout the project development.

1. **Study the shortlisted file formats in detail**

After studying these file formats, some of them will be shortlisted. The proposed project will focus on only these much file formats. This step will include deep study of shortlisted file formats.

1. **Study of Image File Format Conversion Libraries:**

This step constitutes the study of the libraries which are already in use for image file format conversion.

This study will mostly focus on following parameters:

* 1. License type (Free / Paid)
  2. API Type (Language, C/C++)
  3. Formats supported
  4. Quality of output
  5. Support / Maintenance for the library

After this study we need to shortlist the libraries to be used for the project according to their superiority. If there is no suitable library available, may need to develop one.

1. **Final Application Development**

General steps for this stage are

* + Crate test applications for each library
    - To understand use of APIs in a C++ program
    - To test the quality of conversion
  + All test applications can be merged to create a final generic application with user interface

1. **Bibliography**

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[8] http://3dplmsoftware.com

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