Digital Image Measurement Tool

Requirements Document

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1. **Introduction**

1.1 **Purpose**
This document provides a description of the “Digital Image Measurement Tool”. It details the requirements that have been set forth by the developer, Michael Cianni.

1.2 **Scope**
The software described in this document is useful to a wide variety of professionals and amateurs with a basic to intermediate knowledge of computer programs. The Digital Image Measurement Tool is a program that aids a user in making several types of measurements from digital pictures. The professions that this is useful to include contractors, crime scene investigators, astronomers, and anyone else who needs to take measurements.

1.3 **Reference Materials**
*The JFC Swing Tutorial*, Kathy Walrath, Mary Campione, Addison Wesley 2002;

1.4 **Terms**
These are terms that are commonly used in this document. For a list of other terms, see the Glossary.

**ACTUAL LENGTH**: The distance between two points in the plane of the object in the image.

**DIMT**: Digital Image Measurement Tool

2. **General Description**

2.1 **Product Perspective**
The Digital Image Measurement Tool is a software package that allows a user to import digital photos and take several types of measurements from the image.

2.2 Product Functions
There are a variety of functions that make up the Digital Image Measurement Tool. They are listed here; visit another section to read more information on each function.
- Line Tool: Allows the user to select endpoints of a line and yields the actual distance.
- Area Tool: Allows the user to select points of a rectangle and yields the actual area.
- Angle Tool: Allows the user to select points of an angle and yields the actual angle.
- Free Tool: Allows the user to move the cursor around an image and yields the actual distance the cursor has moved.
- Ruler Tool: Allows the user to select endpoints of a ruler and draws a ruler onto of the image that correspond to the actual distance.
- Grid Tool: Allows the user to display a distance based grid onto of the image.

2.3 User Characteristics
The users of the Digital Image Measurement Tool should all have basic computer skills. There are more advanced options which more advanced users will be able to utilize. For a complete breakdown of tools vs. skills see section Tools and Skills.

3. Functional Requirements

3.1 Users
In order to use the Digital Image Measurement Tool all that is needed is the software, a digital camera with specifications, and a measuring device (See 3.3 Required Information).
3.2 Digital Camera
Any digital camera can be used with the Digital Image Measurement Tool as long it has capabilities to upload pictures to a computer. Of course, the higher the quality pictures it takes, the higher quality the images will be and the more accurate the measurements will be.

3.3 Required Information
In order to use the Digital Image Measurement Tool the user must have some required information. The more accurate this information is the more accurate the measurements that are calculated will be.

3.3.1 Camera Specifications
The nature of the measurements taken using the Dimt require that user input specifications for the camera they used to take the pictures when prompted by the program. The user must know the field of view for their camera when taken from any distance. For example, this camera takes a picture 4 feet wide when the distance from the camera to the object is 6 feet away. This data only needs to be specified once for each camera used.

3.3.2 Photo Specifications
The nature of the measurements taken using the Dimt require that the user input the distance between the object photographed and the camera lens in order for the program to make its calculations. This can be taken using any type of measuring device, but makes the job much easier if a laser measuring tape with memory capabilities is used. Hopefully, if this program is deemed useful by many professionals there could be a digital camera engineered that saves this data when it takes the pictures, making the process much easier for the user.

3.4 The Functions
Listed here are the functions that are available to all users of the Digital Image Measurement Tool

3.4.1 Measurements

The heart of the Digital Image Measurement Tool is its ability to take several types of measurements from images once they have been imported and displayed by the user.

3.4.1.1 Line Tool

The line tool is the most basic tool used in the Digital Image Measurement Tool. After importing and displaying a user chosen image, the user can select two points on the image, each one specifying an endpoint of a line, and the system calculates the actual distance between the two points.

3.4.1.2 Area Tool

The area tool allows the user to select three points of a rectangle. The first point corresponds to the upper left corner of the rectangle, the second point corresponds to the width of the rectangle, and the third point corresponds to the height of the rectangle. The system then calculates the area based on the points specified by the user.

3.4.1.3 Angle Tool

The angle tool allows the user to select three points of an angle. The first point corresponds to the endpoint of a segment of the angle, the second point corresponds to the vertex of the angle, and the third point corresponds to the endpoint of the other segment of the angle. The system then calculates the angle based on the points specified by the user.

3.4.1.4 Free Tool

The free tool allows the user to draw freestyle shapes or paths on an image. The first click corresponds to the start of the freestyle path and the
second click corresponds to the end of the path. The system then calculates the actual distance that the path has traveled.

### 3.4.1.5 Grid Tool
The grid tool allows the user to display a grid on top of the image. The grid shows intervals of measurements along the left and bottom (or left and top) edge of the image. The layout of the grid can be set by the user from the Preferences Window.

### 3.4.1.6 Ruler Tool
The ruler tool allows the user to select two endpoints of a ruler and the system then displays a ruler between those two points. The user can set the units and the opaqueness of the ruler from the Preferences Window.

### 3.4.1.7 Undo Tool
The undo tool allows the user to remove the last item that they have added to the image. All the additions to an image are stored, so the user can remove any number of items whenever they wish.

### 3.4.1.8 Log File
The DIMT keeps a log of all the items drawn on each image, and a list of these items can be viewed in a log file.

### 3.4.2 Saving
There are two ways to save any work the user does in the DIMT.

#### 3.4.2.1 Current Project
The user can save the current project, including the images imported and the items drawn on the image. The user can later open it back up, or view the text file that includes all this information.

#### 3.4.2.2 Images
The user can save the image that they are working on, including all the items that are drawn on top of the image. The image can then be viewed from any program supporting the major image file types.

3.4.3 Others

There are two other functions that are available to the user.

3.4.3.1 Preferences

There are several preferences that are customizable by the user:

- **System**: Select US or Metric
- **Angles**: Select Degrees or Radians
- **Grid Layout**: Select West-South or West-North
- **Line Thickness**: Select Small, Medium, Large or Extra Large
- **Line Color**: Select Black, White, Yellow, or Red
- **Draw Ruler**: Select Opaque or transparent
- **Save Image**: Select jpeg, jpg, gif, tiff, or tif
- **Quality**: Select High or Low

3.4.3.2 User Guide

The DIMT will include a user guide that will help the user to learn the basic steps to take to use the program, more information about the tools available, and get answers to frequently asked questions.