Software Design Document

(Documentul de Proiectare a Soluţiei Aplicaţiei Software)

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Cartoon Photo Software Application

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Cuprins

1. Purpose

The sole purpose of this document is to describe the software application Cartoon Photo. This paper is a guide presenting the solution proposed for the second project of Software Project Management.

2. Content

This paper contains two major sections:

- Data models and libraries - presents the main tools used
- Architectural and components models - presents the architectural templates used, the system architecture and describes the architecture components

The testing of the solution can be achieved by visually comparing the input and output images or by comparing them using a programming tool (e.g. vim diff).

3. Data models and libraries

3.1. CV2

CV2 is a library of Python bindings designed to solve computer vision problems. CV2 is used for all sorts of image and video analysis, like facial recognition and detection, license plate reading, photo editing, advanced robotic vision, optical character recognition, and a whole lot more.

3.2. NumPy

NumPy is the fundamental package for scientific computing with Python. It contains among other things:

- a powerful N-dimensional array object
- sophisticated (broadcasting) functions
- tools for integrating C/C++ and Fortran code
- useful linear algebra, Fourier transform, and random number capabilities

Besides its obvious scientific uses, NumPy can also be used as an efficient multi-dimensional container of generic data. Arbitrary data-types can be defined. This allows NumPy to seamlessly and speedily integrate with a wide variety of databases.

3.3. Pil (Python Imaging Library)

Python Imaging Library (abbreviated as PIL) (in newer versions known as Pillow) is a free library for the Python programming language that adds support for opening, manipulating, and saving many different image file formats. It is available for Windows, Mac OS X and Linux. The latest version of PIL is 1.1.7, was released in September 2009 and supports Python 1.5.2–2.7, with Python 3 support to be released "later".

Development appears to be discontinued with the last commit to the PIL repository coming in 2011. Consequently, a successor project called Pillow has forked the PIL repository and added Python 3.x support. This fork has been adopted as a replacement for the original PIL in Linux distributions including Debian and Ubuntu.

Pillow offers several standard procedures for image manipulation. These include:

- per-pixel manipulations,
- masking and transparency handling,
- image filtering, such as blurring, contouring, smoothing, or edge finding,
- image enhancing, such as sharpening, adjusting brightness, contrast or color,
- adding text to images and much more

Some of the file formats supported are PPM, PNG, JPEG, GIF, TIFF, and BMP. It is also possible to create new file decoders to expand the library of file formats accessible.