

Development by a Graphic User Interface - Programs in the Tkinter Package Using Modern Pedagogical Technologies in the Field of Medicine

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Annotation: This Python programming language and the Tkinter package are described, their advantages and disadvantages, and the main applications of programs with a graphical user interface (GUI) are considered. In the Tkinter package, you can create graphics programs that run on different operating systems. The main part of the work presents a practical program used in the Tkinter package and its analysis.

Keywords: Python programming language, Tkinter package, GUI program, medicine, elementary mathematics, creative thinking, information technology, mathematical logic, probability theory, elements of mathematical statistics, reality.

INTRODUCTION

Improving the effectiveness of teaching the subject "Programming Language Python" on the basis of integration and communication consists in setting goals, developing teaching methods, focusing on training personnel capable of developing the state of teaching this subject.

Development of a lecture methodology on the topic "Creating GUI programs in the Tkinter package" of the course "Python Programming Language".

Tasks for creating an educational and methodological complex, developing a methodology for its use:

- Methodical analysis of problems in the field of teaching "Python Programming Language" in higher educational institutions;
- Collection, analysis of literature on the "Python programming language" and familiarization with their capabilities;
- Consider the technologies for forming the content and parts of the educational and methodological complex about personal computers and their development from the Python programming language.

ANALYSIS AND METHODOLOGY OF THE LITERATURE

Python is one of the most popular interpreted programming languages, designed to improve code readability and ease of syntax. Python has advanced graphics processing capabilities. In addition to various built-in image processing modules, there is a wide range of code programs for this graphics processing. This article focuses on the most popular and actively maintained Python graphics libraries for various computational tasks such as image rendering, diagramming, image recognition, and other functions.

In addition to helping people form a certain worldview in the information environment, the science of the Python programming language has played a fundamental role in mastering information and culture.

In today's age of "Information", not only the computer literacy of students is increasing, but also, teaching them programming languages, it becomes the basis for creating programs for them. From professional activity in universities, academic lyceums, vocational colleges and technical schools, he attaches great importance to the use of information technologies and the application of the subjects taught in them.

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DISCUSSION

If you're looking for a Python image manipulation library, check out Pillow. It is a continuation of PIL (Python Imaging Library), a longtime enthusiast resource library for graphics processing written entirely in Python that has been inactive since 2009.

This library only needs zlib and libjpeg to perform basic image functions like cropping, resizing and resizing. Extended functionality can be provided by installing other libraries, for example libtiff handles compressed TIFF files, and libwebp allows Pillow to read and play the WebP format. There are also pre-built Docker images for quickly installing dependencies on popular operating systems.

Each version of Pillow only supports a specific set of Python versions. You can see them in the Python Support Matrix [here](#).

Python-OpenCV - image and video analysis in Python



OpenCV package logo

OpenCV is a standard for image and video analysis. The library was originally written in C++ and contains over 2500 optimized, professionally developed algorithms. It has its own Python interface and supports Windows, Linux, Android and Mac OS. Among the interfaces, Python is the most popular because it fits well into the ecosystem of Python packages for machine learning and data analysis.

Puvips - image compression in Python

Puvips is a Python wrapper for libvips, a native library for handling horizontal bitmaps. Compared to similar libraries, libvips is fast and consumes less memory.

Libvips supports over 300 image operations, including arithmetic, histograms, convolutions, morphological operations, noise filtering, color, upsampling, statistics, and more. It supports a wide range of image formats including JPEG, TIFF, PNG, WebP, FITS, Matlab, OpenEXR, PDF, SVG, HDR, PPM, SSV, GIF, Analuze, NIFTI, DeepZoom, and OpenSlide. It also integrates well with ImageMagick and GraphvizMagick, allowing you to download formats such as DISOM.

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PuMatting is a set of algorithms that solve the problem of alpha matting. If you don't know what an alpha matte is, look at the image below and you'll get an idea.

When rendering, given an input image and a clipping map hand-drawn by the background viewer, PuMatting estimates the alpha channel of the foreground object based on this clipping map, which can then be used to map it to another background image.

SVG - is the image format of the modern web. It can be scaled to any size without losing clarity, looks great on HD displays, and can be easily added to web pages. Pugal is a dynamic SVG charting library written entirely in Python capable of creating beautiful and responsive charts. Using Pugal, you can



create a complex SVG chart with just a few lines of code. There are several demos on the Pugal documentation page.

Matplotlib - creating data visualization in python

Matplotlib is a Python library that allows developers to create visualizations such as bar charts, scatterplots, bar charts, pie charts, and more. It is especially popular in the world of data science and is often used to visualize and understand raw data.

Matplotlib provides mechanisms for working with dataframes and arrays, which are native formats of other popular Python libraries such as NumPy and Pandas. The Pypplot module closely mimics MATLAB plotting commands. This way, MATLAB developers can easily switch to programming with Python.

The Seaborn package is based on the Matplotlib library. It is used to create attractive and informative statistical graphs.

The syntax of Seaborn is simpler than that of Matplotlib, but it can be used to create attractive visualizations. The library adds tons of code, providing commonly used default themes. Once you get the hang of Matplotlib, you can move on to Seaborn for more complex visualizations.

Bokeh - interactive visualization with Python

Bokeh is an interactive Python visualization library built for the modern web. Louiha is split into two parts: the Bokeh server, which acts as the rendering engine, and BokehJS, the browser-based runtime client library that the Bokeh handlers eventually interact with.

In Bokeh, you can create JavaScript-based visualizations without having to load the JavaScript yourself. The library can help you create rich web graphics, from simple graphs to complex dashboards with streaming data, using just Python code.

phase_recognition - makes it easy to accurately identify a person with Puthon

phase_recognition is a Python library that builds a modern evaluation version of dlib built from Python deep learning. The library makes it easy to accurately identify objects in images with a success rate of over 99%.

phase_recognition can be used as a command line tool to batch process multiple images, or its API can be used to build another application on top of it.

The graphical user interface (GUI) of Python is very useful for various programs. These technologies can be used to turn your designs into unique, aesthetically pleasing, visually appealing, highly interactive environments and provide other similar features to users. Even these tools can be used to develop machine learning or deep learning AI models to distinguish them from other models.

The updated and evolving Python programming language is designed with practical and creative thinking in mind. From a practical point of view, among the research materials, the science “Puthon programming language” in higher education relies on the theoretical and practical conclusions of the sciences “Higher Mathematics”, “Elementary Mathematics” and “Physics”. The implementation of the program is based on theoretical and practical knowledge in higher mathematics and physics, planned in the curriculum. At the same time, the results of research conducted in the system of higher education contributed to the development of a system of continuous education, the development of promising training programs, the development of the material and technical base of institutions, and the informatization of education.

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