



## SPACE SHOOTERS – A 2D GAME USING PYGAME

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### ABSTRACT

Video games play a vital role in environment. However, it requires a huge manpower and extensive knowledge about animation and programming. Python is a very powerful platform for making game applications. It has many sub modules for the development of game related application. In python different ports are available for all desktop system and consoles so that you can develop game in one platform and play it on another. This makes python platform independent.

**Key Words:** 2D games, space shooters, pygame, python, desktop application, console games.

### 1. Introduction

The main objective of the project is to develop a 2d-platform game (a desktop program) to interact with the user. Another objective of the game is to make interaction between the user and the system using graphical user interface for making fun.

Python have many modules, some of them are console based and some are Graphical base. CLI programs deals with text through the print() and input() functions. These programs display text on screen and let user type text from the keyboard.

The CLI program gets input from the keyboard using input() function. This means that in CLI action games are impossible to make, because in real time game application code should run continuously without waiting for the user input. But python also provide some modules that provides functions for creating programs with a graphical interface. GUI programs will show a window with images and color and is suitable for making games also.

Some of the fields where we can implement python GUI based application are: Games

- Scientific applications
- Web frame works and applications
- Business and enterprise application
- Image processing application.
- Graphic design applications
- Language development
- Prototyping

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game related application. In python different ports are available for all desktop system and consoles so that you can develop game in one platform and play it on another. This makes python platform independent.

## 2. Related Works

Our work is motivated by a rich body of prior works. In this section, we mainly review these works from the perspectives.

## 3. Literature Survey

This paper will demonstrate how to create a simple 2D game in python using a module called pygame which is completely free and open source.

The environment was simulated using PyGame in Python

3.4 environment. The objective of the tool is to simulate the cloud network virtualization platform to transfer the packets from any source node to a selected destination node. The simulations demonstrate that the packet selects the optimum path to travel from the source node to the destination node.

The aim of this paper is to create a Python program which automatically translates the python language into traditional Chinese to help those people who want to learn computer programming but are unable to learn so because they don't know English at all or have very little knowledge about it. This application uses Tk-Based GUI program. The basic idea for

developing the project was for those countries where English is not an official language and people face many difficulties. The GUI-program translates, edit and browse any Python program in Turtle Graphics.

The paper talks about how to interface the plant parameter to a web server so that we can constantly monitor the state of the process plant at various places and locations by different supervisors. And this is done using the Python and Internet of Things. Here the author also takes into account the temperature parameter so as to regulate it at any desired value. Data will be received at the supervisor's personal computer so that he can analyze and monitor the state of plant parameters using the Graphical User Interface.

VISION/HPC is a Python based. Drag-dropping visual programming interface. It reduces complex programming tasks like dropping and connecting icons in GUI flow chart. As a window based open-source Python package, it includes numerical array and linear algebra acronym of numpy, statistical interpolation i.e. SciPy, scientific visualization called matplotlib, Python imaging library and interactive parallel computing called IPython.

Here a Geant4-Python interface called "Geant4Py" is introduced, which provides a set of Python modules for using Geant4 on Python. Also, it shows various applications using Geant4Py, including compile-free scripts, online histogramming analysis with ROOT, Web applications, GUI applications and tools for physics validation,



educational uses and medical simulation, discussing runtime performance which can be tuned between execution speed and interactivity for each use-case.

To integrate the various things of SNS DAS system we use PyDas module. It enables to user defined automations of neutron scatter experiments in a fast and convenient way. It provides wxPython GUI for routine experiments and also IPython command line scripting. The matplotlib and Numpy are used to present the data and perform simple analysis. The document gives data on data acquisitions system and PyDas architectures and implementations along with real time examples. The paper gives the explanation about the design, program and application of the improved educational tool called aura which was constructed using Python and PyQt Python bindings. The paper presents a new concept like using a single tool which can relate the syntaxes of various programming languages and algorithm builds. It also exponentially increases the understanding and retaining capacity, since they can correlate between the programming languages. The software is unlikely to help the students who have first try with the languages. The application is used in making the students understand about how to understand the algorithms and thus assist the learning the multiple languages on a mono-platform using the interactive GUI. The paper demonstrates on how the usage of Python and PyQt bindings, a complete feature-rich applications that implements the innovative algorithm building techniques that contains the browser, combination of programming platforms, a code generator and a real-time code sharing hub which is in-built into a single interface. This also contains works on how the python works as a building tool, it requires very less lines of code than the feature rich coding language, in the same time it does not compromise on stability, inter working and strength of applications.

#### 4. Problem Definition

- In order to play computer games, the players need to give inputs to the processing units through the input devices like Keyboard.
- One of the major difficulties is to make the players in the form of vector images like .jpg format.
- For developing the vector images in games, we use photoshops and pygame module and python programming languages.

#### 5. Overview of the project

Here we have created a classic space shooter game in python using Pygame module. The game is very easy to play. It will be played by only one player, he will have the objective to control the air craft which will be moving constantly inside the computer console window. Randomly the enemies gets into the field of the user. The user has to defend the enemies to not enter into its range. Its range is fixed by default..

There will be a bunch of enemies. The player has to shoot them in order to save his range. The player can able to shoot multiple bullets at a time. Dynamically the score of the player is calculated based on the number of kills the player makes and it is displayed in the top right of the corner. If the game gets over at once the game score will be

displayed in the console along with the text game over.

The simplest method for organizing a code for a game is to divide it into 6 sections, loading a module, resource handling class, game object classes, any other game functions, initializing the game and game loop.

## 6. Block Diagram

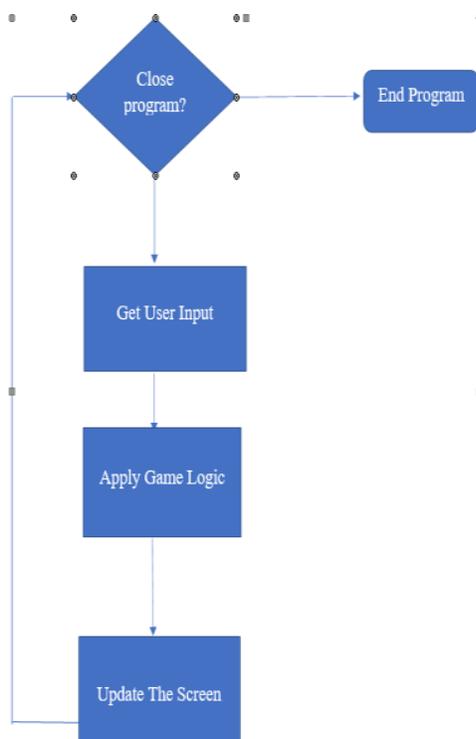


Fig : 5.1

## 7. Proposed methodology

Here we have created a classic space shooter game in python using Pygame module. The game is very easy to play. It will be played by only one player, he will have the objective to control the air craft which will be moving constantly inside the computer console window. Randomly the enemies get into the field of the user. The user has to defend the enemies to not enter into its range. Its range is fixed by default. There will be a bunch of enemies. The player has to shoot them in order to save his range. The player can able to shoot multiple bullets at a time. Dynamically the score of the player is calculated based on the number of kills the player makes and it is displayed in the top right of the corner. If the game gets over at once the game score will be displayed in the console along with the text game



over.

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## **7.1 Loading a module:**

It requires a importing the local pygame names and pygame module itself.

## **7.2 Resource handling class:**

These classes handles the most commonly used basic resources. For eg: Loading images,loading sounds, connecting anddisconnecting to and from the network, loading the saved game files and any otherresources which mightbe there.

## **7.3 Game object classes:**

It defines the classes which you are going to use foryour game objects.

## **7.4 Any other game functions:**

We need to define other necessary functions like keyboard movement, snake movment, generating the food etc. any code that you put in to the main game logic, but would may understanding said logic harder, should be always kept in to itsown functions.

## **7.5 Initialize the game:**

We need to initialize the game including the pygame objects,the background, the game objects and any other code you want to add into your program.

## **7.6 The main loop:**

In this we will put any input handling that is hitting the keys/arrow button. Also we will put code for updating the game objects and finally the game screen.

## **8. Feasibility study**

The feasibility study deals with all the analysis that takes up in developingthe project. Each structure has to be thought of in the developing of the project, as it has to serve the end user in a user- friendly manner. One must know the typeof information to be gathered and the system analysis consist of collecting, Organizing and evaluating facts about a system and its environment. The main objective of the system analysis is to adaptive leaf shape clustering and rot detection in leaves. The recommendation through windows application needs to be analysed well. The details are processed through coding themselves. It will be controlled by the programs alone.



### 9. Economic feasibility

The organization has to buy a personal computer with a keyboard and a mouse, this is a direct cost. There are many direct benefits of covering the manual system to computerized system. The user can be given responses on asking questions, justification of any capital outlay is that it will reduce expenditure or improve the quality of service or goods, which in turn may be expected to provide the increased profits.

### 10. Operational feasibility

The Proposed system accessing process to solve problems what occurred in existing system. The current day-to-day operations of the organization can be fit into this system. Mainly operational feasibility should include an analysis of how the proposed system will affect the organizational structures and procedures

### 11. Technical feasibility

The cost and benefit analysis may be concluded that computerized systems are favourable in today's fast moving world. The assessment of technical feasibility must be based on an outline design of the system requirements in terms of input, output, files, programs and procedure. The project aims to adaptive leaf shape clustering and rot detection in leaves.

The current system aims to overcome

the problems of the existing system. The current system is to reduce the technical skill requirements so that more number of users can access the application.

### 12. Analysis

- Uses C and assembly code for core functions. Python uses C for core functions as C is 10-20 times faster than python code
- Simple and easy to use: python has almost every function which is already built in, so it becomes very easy for any one to program a game using py game because there are more than 20 sub modules which helps in making gaming program easy.
- Pygame have submodules like
- Does not require a GUI to use all functions: pygame can be used without a monitor also like if we want to use it for processing an image, getting joystick input or to play sound.
- Small amount of code: Pygame does not require us to write hundreds and thousands of lines of code for things that we may not even use or may not be used that often. The core of pygame is to keep the program simple and to add extra things like GUI libraries and other effects without any trouble.
- Finally we conclude from our analysis that pygame is not the best game library but we think that for a beginner it is great because it is easy to understand and to implement.



Fig. 12.1



Fig. 12.2

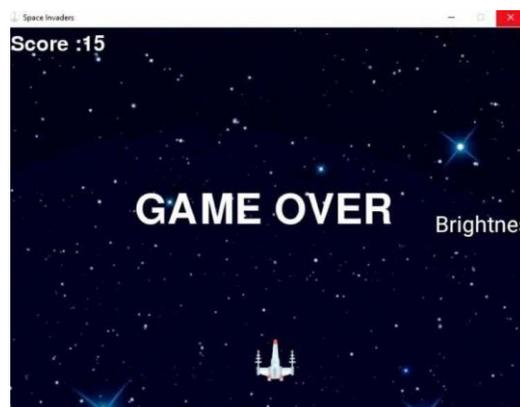


Fig. 12.3

### 13. Conclusion

We were successful in creating a mini version of traditional classic snake game using Pygame module available in



python. The user control classic snake game has been successfully implemented and tested. We learned several project management techniques to develop small scale project using python GUI module Pygame. In this new era of technological growth developing a game is very rewarding as well as there is something very exciting about being able to see and to interact the code you have written.

Pygame is not a very good tool for developing a high level game but it surely is a very good module for developing small scale games.

Also we know that there is a lot of improvement that we can do in this project and we will try to implement those improvements in the near future.

## 14. Acknowledgements

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