

# XINUPI: GRAPHICS

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## Introduction

This project is a part of the effort to port Embedded Xinu to the Raspberry Pi in order to create an inexpensive, lightweight operating systems teaching tool.

This is the one of the first simple yet fully functional RPi graphics drivers. This is also a new implementation of turtle graphics that doesn't require prior knowledge of Python or Scratch.

## Graphics Driver

The pixel data is stored in a structure known as a "framebuffer". Each pixel is a 32 bit memory-mapped value corresponding to transparency, red, green, and blue.

The driver creates a communication channel between the CPU and the GPU, so that the CPU can change the pixel data, and therefore change pixels onscreen.

## Graphics Application

The graphics application, Turtle, is a simple, intuitive way to teach spatial reasoning, sequential thinking, and basic coordinate geometry.

Students have access to an onscreen "turtle" and a small list of combinable commands that can be used to draw any number of complex figures.

## References

- "Main Page". Embedded Xinu. Marquette MSCS Department, 11 June 2011. Web. 23 July 2013. <[http://www.xinu.mscs.mu.edu/Main\\_Page/](http://www.xinu.mscs.mu.edu/Main_Page/)>.
- "Raspberry Pi". The Raspberry Pi Foundation, 2013. Web. 23 July 2013. <<http://www.raspberrypi.org/>>.

