Product Vision

The Pixel Spreadsheet is an educational tool that is being developed to educate users on how data is represented digitally. The image is one of the most fundamental types of digital data used everyday. By showing the users what a pixel actually is and how they can combine to form an image, we hope to teach our users how to think about the underlying information and how it is stored.

Problem Statement

The Problem	Create a simple program that converts images to a spreadsheet format. By allowing users to manipulate an image in the spreadsheet format, we hope that they will begin to understand what each of the channels are, how the rows and columns work, and in turn what a digital image is.
affects	Any person who wishes to learn more about image representation. This includes middle school, high school, and young college students.
The impact is	Students may never be taught a basic concept such as image representation in traditional classes.
a successful solution would be	An easy to use program that will select images or spreadsheets(in the proper format) and convert back and forth. This program will run on Mac/Windows as either a native application or on top of a virtual platform.

Product Position Statement

For	Students taking an introductory science or computer science class
Who	Learning about the representation method of images in the digital space
Our System	All SW, multi-platform compatible
That	The user will find images, convert them to spreadsheets, and then apply transformations within the spreadsheet (as math functions). The program will then convert the spreadsheet back to an image format so that the user can understand how the numbers and displayed image relate to one another.
Unlike	Photoshop - the purpose of our program is not to manipulate images as you would in real life (visually cutting/tinting/painting). Instead, our focus

	is to look at the image space as a function space where the numbers and inputted functions will later manifest themselves in a visual manner
Our Product	Focus on education

Users
- Introductory science/Computer science students
- Teachers of said courses
- IT staff to install the software
- Those who wish to learn how a digital image is composed

Feature List
- Image -> spreadsheet conversion
  - Multiple image types will be accepted (jpg, bmp, png)
  - The spreadsheet will be in a .CSV file, this file can be opened directly into Excel without any import functions
  - The spreadsheet is ASCII and not binary; this means that the file can also be opened in any text editor such as notepad
- Spreadsheet -> image conversion
  - Handles missing rows, columns
  - Handles invalid values (outside of [0,255])
- Image viewer
  - When an image is loaded into memory, a preview window will display that image before the user converts the image
  - When a spreadsheet is finished converting, the new image will be shown
- Multiple image type support
- Spreadsheet viewer/editor instructions
  - We will provide detailed instructions for the most basic Excel macros, how to paste down an entire column, how to rename a column, and how to properly save the file.

Constraints
- Must run on Mac OSX/ Windows
  - Linux/Unix is not needed yet, but may be needed if a server application is requested in the future
- Simple and easy to use
- Must be easily modified from source code (extendability)
- Must be able to withstand continuous use and very large spreadsheet sizes well (scalability)
- Must run without bugs or crashes (stability)
- Must be able to run with low to non-administrative user privileges
- Relatively fast conversions (under 30 seconds including writing the file)
- Excel must be able to load the file without any extra scripts
- OpenOffice and older Excel max rows support through a shrink button on the GUI
- Every stage must be accessible to users who may not have a lot of experience with computers