The GIMP and I



A journey through the use of GIMP.

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Points to cover

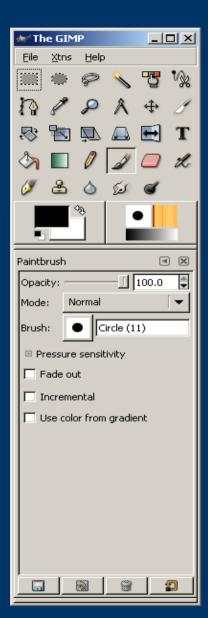
- What is GIMP? (www.gimp.org)
- Some fundamentals
- Fixing Photographs
- The GTK for software development
- A waving flag example
- Using GIMP to simulate flow of chemicals in the environment (advection, dispersion, decay)
- Statistical processing in images
- Special effect editing using GIMP Animation Package (GAP)

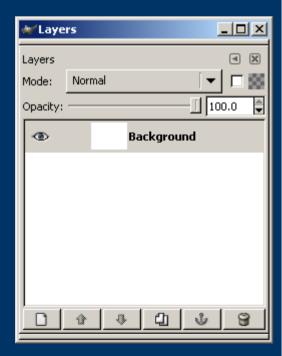
What is GIMP?

- Picture editing software
- Started in the 1995 with a couple of questions.
 - What features, What file formats
- Animation tool
- Graphical User Interface (GUI) toolkit the GTK
 - The core of the GNOME desktop
- A fun tool to explore concepts in Computer Science, Math and Statistics
- Free and in Freedom and cost

Some fundamentals of the interface

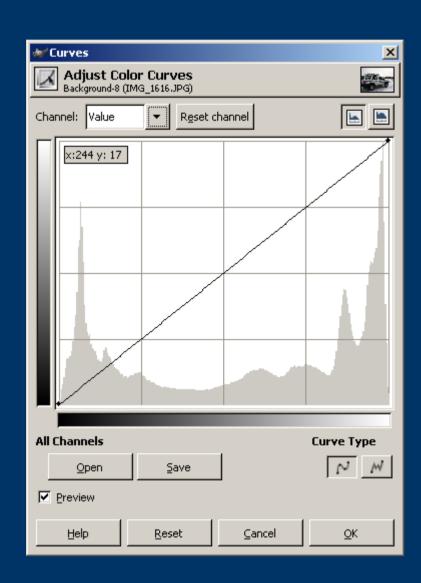
- Different than typical Windows Program.
 - A multiple window interface.
- Palette, Layers,Options
- A bit daunting
- Can do anything MS-Paint can do
 - But a lot more
- Infinite Undo





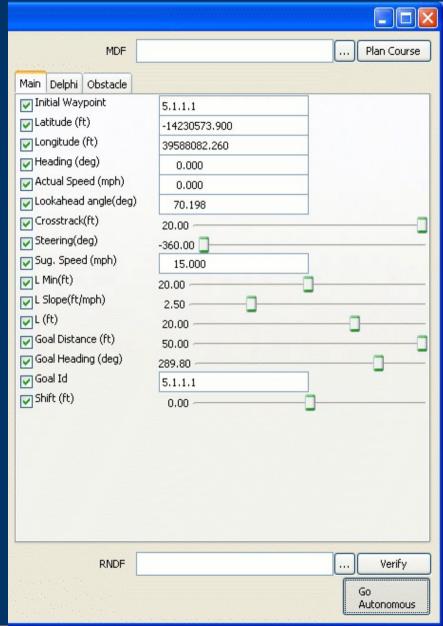
Fixing photographs

- All cameras have a limited range of color and value (brightnessdarkness)
- Human vision is inherently non-linear.
 Even more non-linear if "interpretation" is added
- Outdoor photography magazine



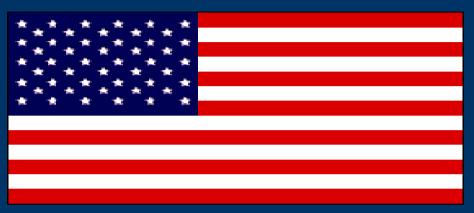
The impact of the GIMP Toolkit

- Is the base set of tools for GIMP
- Scripting encouraged encapsulation of concepts
- Free to use
- GLADE is a
 WYSIWYG editor for
 GTK application
- I use just the C interface



A waving flag example

- You have an orthogonal view of a flag
- But want a waving flag
- Copyright
 infringement is
 \$250,000 for each
 copy
- Use GIMP
 - In just a few (repetitive) steps



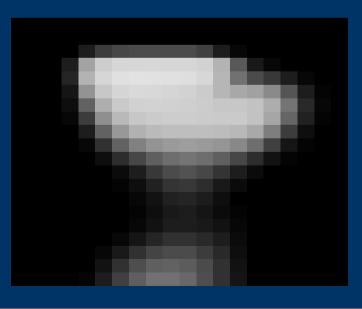




Some of the same skills can be used to explore mathematical modeling

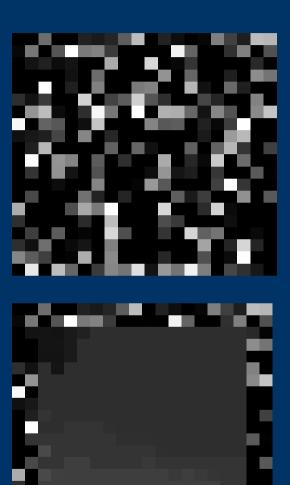
- A filter is usually implemented as a convolution matrix on the existing image
- Edge filters are clearly just the convolution matrix
- But the convolution matrix could be used for simulation





Statistical approaches in images

- Making images look old by adding in "noise"
- Making images look like they have static
- Use median filtering to remove errant noise in the picture



Special Effects with GIMP

- Turn your son into Jedi
- Shoot video with digital camera or import video to AVI
- Use GIMP Animation Package GAP to navigate to selected frames
- Add special effects
- Reassemble frames
- Labor intensive





The Results



Conclusion

- GIMP is very useful
- GIMP is fun
- I have not covered many capabilities of GIMP
 - Web Button generation
 - Web ImageMap generation
 - Special font construction
 - Completely scriptable with ScriptFU
 - Completely customizable with C/C++ interface
- GIMP is free as in freedom and price
- Download the GTK and GIMP at www.gimp.org