# Bringing GIS to Octave

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# Barriers to Octave Use

- Ignorance, few people know about Octave
- Windows dominance on the desktop
  - Free Software not as popular for Windows users
  - Octave not a simple install for Windows
- Most Matlab users get it for “free” via institution
  - Unable to see any advantage of using Octave instead (Linux version available since 1996)
- Compatibility
- Toolboxes
- Graphics

All related & real “show stoppers” for many

**Many users use Matlab primarily for plotting**

# Octave Graphics

- Based on GnuPlot
  - Many man-years of effort put into this package
- Some work done to work with PLPlot & GracePlot
- Matlab advantages
  - Interactive (i.e. Rubberband zoom box)
  - Better 3D graphics (OpenGL)
- Matlab graphics are not THAT complex
  - If we really want 100% compatibility, perhaps we should start from scratch
  - Widget set should be cross-platform
    - But not Java

# MathWorks Mapping Toolbox

- Brings GIS to the Matlab user with a familar interface
- Originally developed by Systems Planing and Analysis (SPA)
- Over 400 functions
  - Most very small (e.g. deg2rad)
  - Most not used
    - Common use is just for basic vector political boundary map data
- Full API documentation available at: http://www.mathworks.com/products/mapping/

# Free Software GIS

- GRASS
  - Currently accepted Free GIS program
  - Extremely unfriendly to use
- GDAL
  - Library to read and write most GIS file formats
  - http://www.remotesensing.org/gdal/
- Many more packages at FreeGIS.org
  - Most others not applicable to this project

# Free GIS Data

- Good vector maps available from Penn State
  - http://www.maproom.psu.edu/dcw_data/
- Elevation (terrain) data
  - GTOPO30 (30 arc-second)
    - http://edc.usgs.gov/products/elevation/gtopo30/gtopo30.html
  - USGS DEM (3 arc-second)
    - http://edcftp.cr.usgs.gov/pub/data/DEM/250/
    - U.S. only
  - Shuttle STS-99 tomography mission data (1 and 3 arc-second)
    - ftp://e0srp01u.ecs.nasa.gov/srtm/version2
    - Wrote a program to convert it to standard DTED format

# Getting Started: Plotting

- Accept Matlab's non-standard plotting syntax
  - Agree to mimick “look-and-feel”
- Decide on a widget toolkit
  - Recent Cario work can help with printing, but may not be cross platform
- Prototype GUI
- Develop efficient (fast) data interface

# Getting Starting: Mapping

- Start writing simple stand-alone utilities
- Need an official reference for projection mathematics (100+ functions)
- Get base political map down small enough to distribute with Octave forge
- Depend on GDAL for terrain data I/O
  - Get GDAL accepted into Fedora Extras
- Try to make something useful until new graphics package comes along