

**Rensselaer**

**ESCE 4960: Open Source Software Practice**  
**Lecture 1: Course Overview**  
**August 27, 2007**

**Prof. Roysam, RPI**  
**Prof. Moorthy**  
**Dr. Will Schroeder, Kitware**

# Overview

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- Course objectives
- Course content
- Instructors
- Reading list
- Grading

# Course Objectives

- Discuss the legal, ethical, business and philosophical issues relative to open source software
- Learn an open source development process
- Practice open source software development within group projects

# Course Content

- History
- Legal issues
- Economic issues
- Open source process tools
  - Wiki, source repository, testing, bug tracker, documentation
- Existing open source projects
  - VTK, ITK, CMake, vxl, InsightJournal
  - Others?
- Projects

# Instructors

- William Schroeder
  - Open source developer (VTK, ITK)
  - Founder of open source company (Kitware)
- William Lorensen
  - Open source developer (VTK, ITK)
  - Experience in large company (proprietary software)
- Luis Ibanez
  - Open source developer (ITK, InsightJournal)
- Bill Hoffman
  - Open source developers (CMake)
  - Founders of open source company (Kitware)
- Ken Martin
  - Open source developer
  - CFO open source company
- Profs Roysam, Moorthy
  - Experience with open source systems/data

# Reading List

- Free as in Freedom: Richard Stallman's Crusade for Free Software by Sam Williams, March 2002, 0-596-00287-4
- Open Source Licensing Software Freedom and Intellectual Property Law Rosen, Lawrence E., ISBN 0-13-148787-6
- Free Culture. Lawrence Lessig, <http://www.free-culture.cc/freecontent/>
- Free Software Free Society. Richard Stallman, <http://www.gnu.org/doc/book13.html> , <http://www.gnu.org/philosophy/fsfs/rms-essays.pdf>
- Perspectives on Free and Open Source Software Edited by Joseph Feller, Brian Fitzgerald, Scott A. Hissam and Karim R. Lakhani, ISBN-10: 0-262-56227-8
- The World Is Flat : A Brief History of the Twenty-first Century, Thomas L. Friedman, ISBN-10: 0374292795
- Mastering CMake, K. Martin & W. Hoffman, ISBN 1-930934-16-5
- The Visualization Toolkit An Object-Oriented Approach To 3D Graphics 4th Edition, William J. Schroeder, Ken Martin, William Lorensen, ISBN 1-930934-19-X
- The ITK Software Guide, Luis Ibanez, William J. Schroeder, Lydia Ng, Josh Gates, ISBN 1-930934-15-7

# Evaluation

- Periodic
  - HW assignments
    - Given at the end of class and to be turned in the next class
- Projects
  - Develop software using open source system(s) using open source development process

# Questions / Discussion

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# Open-Source Issues

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- Why open-source?
- Why not open-source?

# Why Open Source?

- Fun
  - form communities
  - engage in a hobby / learning experience
- Profitable - successful business models
  - Red Hat, Inc. (Linux Support)
  - Cygnus Solutions
  - Use Value versus Sale Value (service-oriented business model)
- Altruism - serve the planet

# Why Open Source?

- Open Science
  - Access to data
  - Access to code
  - Collaboration oriented
- Intellectual freedom
  - Ideas are property
  - The territory is being claimed
  - Freedom of expression is being controlled by others
  - Don't give up your freedom!

# Why Open Source?

- Scalable Software Development
  - Eric Raymond *The Cathedral & The Bazaar*

*“open-source peer review is the only scalable method for achieving high reliability and quality.”*

- Business model
  - Support/consulting oriented
  - Maintenance
  - Indirect marketing
  - Simplifies hiring

# Why Not Open-Source?

- Intellectual property concerns
- Chaotic development environment
  - Volunteer-based
  - Distributed
  - No clear authority
- Hard to change code
  - Public API visible
  - Internal structured visible

# Why Not Open-Source?

- Benefits are a function of community size
- Proprietary business model
  - Better understood
  - Greater potential for \$\$
  - Funding agencies encourage

# Establishing An Open-Source Project

- Create a clear vision (requirements doc)
  - Technical domain
  - Software tools
- Involve team-oriented people
  - Big egos are big problems
- Identify leadership / management structure
  - Methods to break conflicts
- Establish an effective software process

# Establishing (cont.)

- Define communication protocol
  - Key: central testing dashboards
  - User, developer mailing lists
  - Weekly TCons
  - Periodic face-to-face meetings
- Pitfalls
  - Establish core architecture early
  - Start development with a few key people
  - Don't start testing too soon
  - Enforce the process!!!
  - Cut off CVS (write) access to the code if necessary

# Use External Tools (no NIH!)

- Use existing open-source tools when they make sense, e.g.
  - VTK
  - ITK
  - DART
  - CMake
  - CVS source code version control
  - Doxygen documentation system
  - SWIG wrapper (interface) generators
  - Vxl/vnl numerics

# Managing IP

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- Copyright
- Patents
- Commercialization strategies

# Commercialization Strategies

- Pure support model
  - Documentation, support, consulting
- Open toolkits, closed applications
  - VTK / Volview, ActiViz
  - ITK / Analyze, Cognita
- Open standards / closed implementations
  - PDF / Distiller
- Open platforms, closed plug-ins
  - VolView plug-in support

# Assignment

## Read:

- Free Culture
  - Introduction
  - Chapter Four
- Free Software Free Society
  - Chapter One: "The GNU Project"
  - Chapter Two: "The GNU Manifesto"
  - Chapter Three: "Free Software Definition"
  - Chapter Four: "Why software should not have owners"