

**Rensselaer**

**Open Source Software Practice  
Lecture 1: Course Overview  
August 25, 2008**

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# Overview

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- Course objectives
- Course content
- Instructors
- Reading list
- Evaluation
- Background
- Assignment

# 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
- Listen to leaders in the field discuss open source issues

# Course Content

- History
- Legal / Intellectual Property issues
  - *Intellectual Monopolies* (next week)
- Economic issues / Business Models
- Open source process tools
  - Process tools: source repository, testing, bug tracker, documentation
  - Communication tools: Wiki, mailing lists, virtual worlds
- Study existing open source projects
  - VTK, ITK, CMake, vxl, InsightJournal
  - Others?
- Student Project & Homework
- Guest Speakers

# Instructors

- William Schroeder
  - Open source developer (VTK, ITK)
  - Founder of open source company (Kitware)
- Luis Ibanez
  - Open source developer (ITK, InsightJournal)
- Guest Speakers
  - Domain experts

# Reading List

- Free Culture. Lawrence Lessig, <http://www.free-culture.cc/freecontent/>
- Open Source Licensing Software Freedom and Intellectual Property Law  
Rosen, Lawrence E., ISBN 0-13-148787-6
- Free Software Free Society. Richard Stallman,  
<http://www.gnu.org/doc/book13.html> , <http://www.gnu.org/philosophy/fsfs/rms-essays.pdf>
- Free as in Freedom: Richard Stallman's Crusade for Free Software  
by Sam Williams, March 2002, 0-596-00287-4
- 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: Alternate two weeks apart (50%)
  - HW assignments (3)
    - Given at the end of class and to be turned in the next class
  - Quizzes (3)
    - Given in class
    - Tests reading assignments
- Project (50%)
  - Develop software using open source development process
    - Existing system
    - New system
  - 20-minute presentations to class at end of semester

# Resources

- Class Wiki
  - [http://public.kitware.com/OpenSourceSoftwarePractice/index.php/Main\\_Page](http://public.kitware.com/OpenSourceSoftwarePractice/index.php/Main_Page)
- Class mailing list (OpenSourceSoftwarePractice)
  - Address all questions to this list
- On-line
  - Books
  - Software
- Rensselaer System
  - Being configured now

# To Do:

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- Attendance
- Sign up for class wiki / mailing list
  - Provide email on sheet

# 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
  - CDash / CTest
  - CMake / CPack
  - CVS / SVN 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:

- [http://public.kitware.com/OpenSourceSoftwarePractice/index.php/Fall2008/Intellectual\\_Monopolies\\_Reading\\_Assignment\\_I](http://public.kitware.com/OpenSourceSoftwarePractice/index.php/Fall2008/Intellectual_Monopolies_Reading_Assignment_I)
- Free Culture <http://www.free-culture.cc/freeculture.pdf>
  - **"Introduction"** (pdf pages 6-14)
  - **"Piracy"** ( pdf-pages 15-17)
    - Chapter One: **"Creators"** (pdf-pages 18-23)
    - Chapter two: **"Mere Copyists"** (pdf-pages 24-34)
    - Chapter three: **"Catalogs"** (pdf-pages 35-37)