

Rensselaer

**Open Source Software Practice
CSCI-4967
Lecture 1: Course Overview
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Overview

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

Principle 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

Contact Information

- Luis Ibáñez
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- Robert Escriva
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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

Learning Outcomes

- Students can state what an open-source license is
- Students can differentiate between different forms of OS licenses
- Students will be able to compare and contrast key points of IP law
- Students can describe viable OS business models
- Students can develop software in a collaborative environment

Course Structure

- 4:00 - 5:50pm
 - First hour: lecture
 - Second hour: collaboration
 - Projects (in-course, external project)
 - Group meetings
 - Office hours
- Occasionally:
 - Outside speakers, video

Course Content

- History
- Economic issues / Business Models
- Legal / Intellectual Property issues
 - *Intellectual Monopolies*
- 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 Projects & Homework
- Guest Speakers / Videos

2009 Reading List

- http://public.kitware.com/OpenSourceSoftwarePractice/index.php/Fall2009/Reading_List

2009 Reading List

- **The Political Economy of Open Source**
- Coase's Penguin
- 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>

Evaluation

- Periodic Quizzes (33%)
 - Given in class using iClicker
 - Tests reading assignments and lecture comprehension
- Internal Class Project (33%)
 - Class-wise development of software system
- External Group Project (34%)
 - 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
- Class mailing list (OpenSourceSoftwarePractice)
 - Address all questions to this list
 - Subscribe: <http://www.kitware.com/cgi-bin/mailman/listinfo/opensourcesoftwarepractice>
- On-line
 - Books
 - Software

Integrity

- Don't cheat
- Contribute to projects
- Show up
- Don't pirate software 😊

To Do:

- Sign up for class wiki / mailing list
- Once this is done, send email to instructors (Luis, Will, Dr. Krishnamoorthy, Robert) with:
 - First name
 - Last name
 - Email
 - Wiki account name

Questions / Discussion

- Class academic level ?
- Using open source?
- Why?
- Which packages?

Open-Source Issues

- 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

- 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:

- **The Political Economy of Open Source**
<http://brie.berkeley.edu/econ/publications/wp/wp140.pdf>

Bring next class:

- iClicker
- Laptop with network connection
- USB Memory stick 4gbyte (will be wiped out)