CSE 8990 04
Software Reuse & Domain Engineering
Spring 2010

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http://www.cse.msstate.edu/~niu/courses/CSE8990

Today’s Menu
Start Here

This Seminar:
Course Orientation
Instructor, Students, Aims, Syllabus,
Readings, Assessment, Policies, etc.
Key Terminology

Next Seminar:
Intro to SW Reuse
Areas of interest

About Me
Where did I come from?
Hometown: Beijing, China
B.Eng. (1995-1999), Beijing Institute of Technology, China
Programmer (1999-2001), Lenovo, China
M.Sc. (2001-2004), University of Alberta, Canada
Ph.D. (2004-2009), University of Toronto, Canada

What is my research area?
Software Engineering
RE (CSE8273, Fall’09) & SW Reuse (CSE8990, Spring’10)

What’s my teaching style?
Interactive (I do count on you)

How to reach me?
Office hours: M 9:30am-11:30am, Butler 329
Other times by appointment
More on ‘communication policy’ later

What else do you want to know?

About You
Basic information
Name
Department, Program (M.Sc. or Ph.D.)
Major research area, Advisor (if known)

Why are you taking this course?
Interested; Had to; No other choice...
I wanna hear the REAL reason :-)"

Define “SW Reuse” in one sentence

We all want to know you
Be out loud please
About This Course

→ Don’t reinvent the wheel
→ Course website
  % www.cse.msstate.edu/~niu/courses/CSE8990
  % Check at least twice a week for announcements and updates (refresh your browser)
→ Seminars
  % Twice a week: M W 3:30pm-4:45pm, Butler 102
  % Mixture of: discussion of readings, student presentations, and lectures
→ Readings
  % 1 or 2 readings per seminar (must read before the seminar)
  % Will be available on the course website
  % Plus various background readings
  % Optional textbook available online ⇒ Really optional
  % This course is research-oriented
    → We’ll rely on recent papers more than books
    → Most of the papers are available electronically
    → Feel free to contact researchers directly for more papers, info, tools, etc.

Why “Reuse”?

“If you want to make an apple pie from scratch, you must first create the universe.”

Carl Sagan

Software Reuse

→ Using existing software artifacts and software knowledge to build new software
  % Not only technical, but also BAPO
→ Benefits
  % Reduced cost
  % Assured quality
  % Increased productivity
  % Green (If there’s no reuse, it’s a waste.)
→ Types of reuse
  % Opportunistic, e.g., while getting ready to begin a new project, the team realizes that there are similar components developed within the organization already
  % Systematic, e.g., (Fortran) libraries, Design Patterns, domain engineering, etc.

(Opportunistic) Reuse Is Everywhere

source: Dr. T.J. Kelly’s office door (BU319)
Domain Engineering

→ Also known as Product Line Engineering
→ Is one form of systematic software reuse
  % Effective reuse has to be domain-specific
  % Identify commonalities and control variations in a domain
→ Reuse is planned, enabled, and enforced
  % Core Assets: for reuse
  % Products: with reuse

SW Reuse
% (You should know the answer now)

Reusable Asset
% SW artifact or SW knowledge

Reusability
% A property of a software asset that indicates its probability of reuse

Software Product Line (SPL)
% A SPL is a set of software-intensive systems sharing a common, managed set of features that satisfy the specific needs of a particular market segment or mission and that are developed from a common set of core assets in a prescribed way. (P. Clements & L. Northrop, 2001)
% Sample SPLs?

Course Objectives

→ Examine the state-of-the-art for research & practice in SW Reuse & SPL
  % Current techniques, notations, methods, processes and tools used in SW Reuse
→ Gain practical experience in selected reuse techniques
→ Understand the essential nature of reuse & SPL
→ Gain a basic grounding for research in reuse & SPL
  % Methodological issues for reuse research
  % Current research issues & direction of the field
  % Awareness of the literature

Assessments And Goals

→ Assessments
  % 40% Project, "Domain Engineering"
  % 40% Term Paper, "practical project", applying 1 or more reuse techniques
  % 20% Term paper presentations, leading discussions, and class participation
    > Individual paper review
  % Milestones are fixed (see orientation handout)

→ Goals
  % Ready to do research in SW Reuse (breadth and depth)
  % Improve your presentation skills
  % Have an idea, carry out some research, write up your work, and prove it’s good work
    > (Gain experience of a peer reviewed process)
Syllabus

- Will be maintained on the course website
  - A tentative calendar is provided in the orientation handout
- Introductory stuff
  - SW Reuse & Domain Engineering
- Themes related to reuse
  - Artifact: requirements, design, architecture, libraries ...
  - Process: generative, components ...
  - Measurement and experimentation
  - Reuse economics
  - Reliability and safety
  - Re-engineering for reuse
  - IR and reuse
- Advanced topics
  - To be explored and determined

Research Literature

- ReNews
  - Resource list
- Conferences
  - International Conference on Software Reuse (ICSR)
    - ICSR-12, Univ. of Pohang, Korea, 2011
    - ICSR-11, Falls Church, VA, Sept 2009
    - ICSR-10, Beijing, China, May 2008
    - ICSR-9, Turin, Italy, June 2006
  - International Software Product Line Conference (SPLC)
    - SPLC10, Jeju Island, Korea, Sept 2010 (due: Feb 28, 2010)
    - SPLC09, San Francisco, CA, August 2009
    - SPLC08, Limerick, Ireland, Sept 2009
    - SPLC07, Kyoto, Japan, Sept 2007
    - SPLC06, Maryland, MD, August 2006
- Journals
  - IEEE Transactions on Software Engineering (TSE)
  - ACM Transactions on Software Engineering and Methodology (TOSEM)
  - ...

Course Policies

- Assignment Deadlines
  - Are very strict (use MSU medical certificates if you are seriously ill)
  - A missed presentation must be re-scheduled to a later date
- Lateness and Re-marking of Term Papers
  - 20% deduction of your mark per 24 hours or less
  - e.g., a score of 90% becomes 72% after one day lateness
  - Maximum of 2 days late
  - Re-marking request must be received within 2 days from the announced return date
- Communication Policy
  - Announcements will appear on the course website. Check regularly.
  - E-mail me by only using your NetID@msstate.edu account. Please include “CSE8990” in the subject of the e-mail.
- Classroom Policy
  - No smoking, no eating, no drinking
  - Mute laptops & cell phones, but be out loud when speaking
- Let’s review the MSU Honor Code together

To-Do List

- Read the “Software Reuse Research: Status and Future” paper (link available from course website)
  - Write an individual review, and send to me by tomorrow (Tuesday, 1/12)
  - One-paragraph summary of the paper
  - At least two questions to provoke class discussion
  - Come to Wednesday’s class prepared

“It is better to look ahead and prepare than to look back and regret.”

Jackie Joyner-Kersee