Testing and Improving a New Text for Teaching Computer Science

Team Members:
David Allen PS, Nicholas Bathum CS, Katherine Hammes ChE, Seon Jeong ME, Leland Johnson CS, Roman Kofman CS, Noh Hyup Kwak EE, Vivek Patel BC, Phillip Rymek CS, Peter Schmitz CS, Michael Tilatti AE, Harry Tran BME

Student Advisor: Yacin Nadji
Faculty Advisor: David Grossman
Background: Traditional Texts

- Long and imposing
- Out of touch with student needs
- Out of touch with industry
Problem: Create an effective Text

- Phase one (last semester):
  - Finish initial draft

- Phase two (this semester):
  - Assess and improve
    - Text itself
    - Teaching Tools
    - Problem Sets
Objectives

- Text itself
  - Revise or rewrite all 8 Chapters

- Teaching Tools
  - Create and test slides

- Problem Sets
  - Test and revise for all 8 Chapters
Innovative Approach

- Simulated a classroom experience
  - Mixed majors (8 total), nationalities, genders

- Comments fueled revisions to:
  - Text
  - Presentation Slides
  - Problem Sets

- Interdependent subteams were created
Code of Ethics and Multicultural Awareness

- Overarching Standard
  - Submit only original work
  - Never lose sight of multicultural audience
  - Never act unfairly

- Paradigm of Code of Ethics
  - Multicultural examples and exercises
    - Directions, simple games, etc.
  - All content original and created with audience in mind
## Project Plan

<table>
<thead>
<tr>
<th>IP R O Deliverable</th>
<th>Start</th>
<th>Finish</th>
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<tbody>
<tr>
<td>Project Plan</td>
<td>1/25/2008</td>
<td>2/22/2008</td>
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<tr>
<td>Final Report</td>
<td>4/21/2008</td>
<td>5/2/2008</td>
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<td>Website</td>
<td>4/18/2008</td>
<td>4/25/2008</td>
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<td>Meeting Minutes</td>
<td>1/25/2008</td>
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<td>CD-ROM</td>
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<td>Team Debriefing</td>
<td>5/5/2008</td>
<td>5/26/2008</td>
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### Planned

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<tr>
<th>Milestones</th>
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<tr>
<td>Chapters 1 - 4 and Midterm report</td>
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<td>3/16/2008</td>
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<td>Chapters 5 - 8</td>
<td>3/14/2008</td>
<td>4/28/2008</td>
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<tr>
<td>Final Report and Deliverables</td>
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<td>5/2/2008</td>
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### Actual

<table>
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<th>Milestones</th>
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<td>Chapters 1 - 4 and Midterm report</td>
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<td>Final Report and Deliverables</td>
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Division of Labor – Initial

- Text
  - Editing Subteam (Chapters 1 to 8)

- Teaching Tools
  - Teaching Subteam

- Problem Sets
  - Problem Set Subteam
Division of Labor – Final

- **Text**
  - Editing Subteam 1 (Chapters 1 to 8)
  - Editing Subteam 2 (Chapters 9 & 10)

- **Teaching Tools**
  - Teaching Subteam

- **Problem Sets**
  - Problem Solving Subteam
  - Problem Revision Subteam
Project Flow

Three Week Cycle

1. **Phase 1**
   - **Begin Chapter**
   - **Technical Team** • Lectures chapter
   - **Editing Teams** • Begin new chapter

2. **Phase 2**
   - **Exercise Team** • Begins homework
   - **Technical Team** • Comments on new chapter

3. **Phase 3**
   - **Editing Teams** • Modify new chapter
   - **Exercise Fixing Team** • Updates exercises
   - **Chapter Complete**
Project Flow

Week 1
- A₁

Week 2
- B₁
- A₂
- B₂

Week 3
- C₁
- A₃
- B₃

Week 4
- D₁
- C₂

Meeting Structure and Deadlines

• Monday Class
  – Final Chapter A
  – Revised Problem Set A
  – Lecture Chapter C
  – Draft Chapter C

• Thursday Online Chat
  – Chapter C Comments 1
  – Revised Chapter B
  – Averaged 45 min in length

• Sunday
  – Chapter B Comments 2
  – Problem Set C
Time and Money Spent

**Time**
- Total: 1,100.9 hours
- Average/person: 91.7 hours
- Average/week: 100.1 hours
- Average/week/person: 8.3 hours

**Cost**
- Photocopies
- Covered by the CS Dept.
- Cost equivalent to typical CS course
Results – Text

• Total Changes: 1,015
  – Insertions: 497
  – Deletions: 518
• Incorporated Comments
  – Average/person/ch
    • CS 4.7
    • Non-CS 8.2

<table>
<thead>
<tr>
<th>Team Member</th>
<th>Major</th>
<th>Average Points Per Chapter</th>
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<tr>
<td>Allen, David Charles</td>
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<td>Tilatti, Michael</td>
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Results – Teaching Materials

- Total Lecture Slides Created: 197

- Average Slides/Chapter: 21.9

- Mock Lectures and Slides Completed for 9 Chapters
Results – Problem Sets

- Total Problems 189
- Exercise Changes
  - Changed 23
  - Added 35
  - Deleted 14
- Total time spent 88.1 hrs
  - Average/problem 18 minutes
  - Average grade 4.15/5
Results – Overall

- **Text itself**
  - Revised or rewrote 7 Chapters
  - Created 3 additional Chapters

- **Teaching Tools**
  - Created and tested 197 slides

- **Problem Sets**
  - Tested and revised for 8 Chapters
  - Created for 1 additional Chapter
Questions?