MICHIGAN STATE
U N I V E R S I T Y

09/02: Course Overview

CSE 498, Collaborative Design

From Students…
…to Professionals

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Fall 2009

Course Overview

➢ Course Logistics

From Students…
…to Professionals

• Client Projects

• Course Logistics Continued

CSE 498, Collaborative Design

• "The Capstone Course"
• Instructors
  – Dr. Wayne Dyksen ("Dr. D.")
  – Matt Luciw (Almost "Dr. L.")
• Class Meetings
  MW, 3:00-3:50pm, 2245 EB
• Course Web Site
  – www.cse.msu.edu/~cse498
  – Check it often.

Course Goals

• Work in a Team Environment
• Build a Significant Software System
• Use (New) Tools and Environments
• Build and Administer Systems
• Develop Your Communication Skills
• Develop Interview Talking Points
• Etc…

Team Course Goal

• Build Large Software Project
  – Design
  – Architect
  – Develop
  – Test
  – Document
  – Deliver
• For Client

• From (Almost) Nothing

• In 15 (Short) Weeks

Project Deliverables

• Project Plan Document & Presentation
• Alpha Demonstration
• Beta Demonstration
• Project Software & Documentation
• Project Video
• Design Day
• Team Web Site
See Other Information, Major Milestones

Course Environment

- Business-Like
- Team
  - External Software Development Company
  - Internal Software Development Team
- Dyksen & Luciw
  - Are Your
    - External Paying Clients
    - Internal Managers
  - Expect Results
    - On Time
    - No Excuses

All-Hands Meetings

Presentations By
- Professor
- Teams
  - Status Reports
  - Software Demonstrations
  - Formal Presentations
  - Project Videos
- Guest Speakers

All-Hands Meeting Agendas

09/02: Course Overview	11/02: The Project Video
09/07: (Labor Day, No Meeting)	11/04: Camtasia Demo
09/09: Project Plan	11/09: Teams: Beta Demonstrations
09/14: Project Schedule & Risk	11/11: Teams: Beta Demonstrations
09/16: Teams: Status Reports	11/16: Teams: Beta Demonstrations
09/21: Prototyping	11/18: Teams: Beta Demonstrations
09/23: Resume Writing & Interviewing	11/23: Teams: Status Reports &/or Demos
09/28: Teams: Project Plans	11/25: Teams: Status Reports &/or Demos
09/30: Teams: Project Plans	11/30: Ethics and Professionalism
10/05: Teams: Project Plans	12/02: Intellectual Property and Copyright
10/07: Career Gallery	12/07: Teams: Project Videos
10/12: Creating & Giving Presentations	12/09: Teams: Project Videos
10/14: Teams: Alpha Demonstrations	12/10: Design Day Setup
10/19: Teams: Alpha Demonstrations	12/11: Design Day
10/21: Teams: Alpha Demonstrations	12/14: Teams: Project Videos
10/26: Teams: Alpha Demonstrations	
10/28: Teams: Status Reports	

CSE498 Lab

- 3352 EB
- Door Lock
  - Electronic Keypad
  - Code = ####
- Systems
  - Two PC's per Team
    - Server
    - Development Machine
  - Team 100% Responsible
    - Building
    - Maintaining
    - Securing
    - Backing Up
- Books
- Conference Area
  - Team Meetings
  - Client Conference Calls
  - Google Calendar
- Appliances
  - Refrigerator
  - Microwave
  - Coffee Maker
- Lockable Storage (If Needed)

Scheduled Lab Times

- No Formal Lab Sessions
- "Credit" for Scheduled Weekly Meetings
  - Team Meeting
  - Client Conference Call
  - Triage Meeting with Matt
- Meeting Times TBA With
  - Team
  - Client
  - Matt
- Students must be available to meet.

IP & NDA's

- IP: Intellectual Property
  - By Default, Owned by You
  - Client May Request
    - Right to Use
    - Assignment of Ownership
    - Etc.
- NDA: Non-Disclosure Agreement
  - May Be Required by Client
  - You will…
    - …respect/protect intellectual property.
    - …respect/protect source code.
    - …etc.
- Normally Not an Issue

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• Course Logistics Continued

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Team / Project Generalities

• Clients
– Vary in Size and Type
– Client contacts/mentors are "volunteers".
• Team Contact Person
– Picked By Team
– Main Point of Contact for Client

Team / Project Generalities

• Project Level of Difficulty
– Hard Enough
– But Not too Hard
• Deliverable
– To the Client
– By the Due Date
• Documentation
– System Administration Manual
– Users Manual

Team / Project Generalities

• Challenges
– Very Short, Unforgiving Time Line
– Client Contact
– Team Dynamics
– Architecture / Specifications (in Three Weeks)
– Entirely New…
  • Languages
  • Environments
  • API's
  • SDK's
  • Processes
  • Protocols
  • Etc.
– Project Management
– Etc…

Project Specifics

• Vary
– Type
– Current State of Specificity

• Challenge
– Connect with Client
– "Nail Down" the Project
  • Hard Enough
  • Not too Hard
– Course Feature, Not Bug

Project Teams/Clients

• Team 01. Auto-Owners Insurance
• Team 02. Boeing
• Team 03. GE Aviation
• Team 04. Meijer
• Team 05. Motorola
• Team 06. TechSmith
• Team 07. Toro
• Team 08. Urban Science

Team 01. Auto-Owners Insurance
Project Overview

Applications for Mobile Devices
- Locate Independent Insurance Agent
  - Search By Name, Address or Zip Code
  - Provide Agent Information
  - Show Locations with Maps
  - Etc…
- Initiate Claim
  - Policy Information
  - Incident Description
  - Upload Photos
  - Etc…
- Technologies
  - Windows Mobile
  - iPhone
  - Blackberry
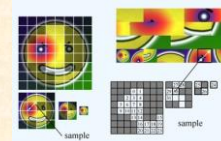 - Etc…

Team 02. Boeing
Project Overview

Sparse Virtual Texturing
- Sparse Virtual Texturing (SVT)
  - Simulate Large Textures with Much Less Texture Data
  - Download Smaller Data and Apply Pixel Shader
  - Map Virtual Large Texture to Actual Physical Texture
- Application of SVT to Ground Textures and Terrains
  - Ground Textures (Geotiffs)
  - Terrain Databases (OpenSceneGraph IVE)
- Integration of SVT into Boeing Virtual Application Suites
  - Flight, Urban Combat, Etc…
  - Control of SVD Parameters via GUI
  - Include Fly, Drive, Skim, Traverse, Move
- Technologies
  - Sparse Virtual Texturing
  - Geotiffs
  - OpenSceneGraph (OSG)
  - Virtual Planet Builder
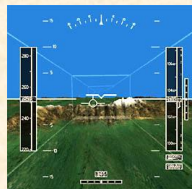 - Etc…

Team 03. GE Aviation
Project Overview

Synthetic Vision Display (SVD)
- Existing Airplane Attitude Indicator (FAA Part-25)
  - Indicates Pitch, Roll & Heading
  - Two-Dimensional
  - Head-Down
- New SVD Attitude Indicator
  - Indicates Pitch, Roll & Heading
  - Adds Third Dimension
    - Forward Looking (Egocentric) Terrain
    - Flight Path Vector
    - Distance and Closure Rates
    - Lateral Map View
    - Side Vertical Profile View
- Integrate with XPlane
- Technologies
  - SVD
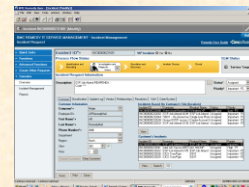 - Open GL, GL Studio
  - Terrain Databases
  - XPlane
  - Etc…

Team 04. Meijer
Project Overview

ITS Scorecard Dashboard
- ITS (Information Technology Services) Scorecard
  - Existing System
  - BMC Remedy Applications
    - Includes Database of ITS Activities
    - Incident (Trouble Tickets) and Change Management
- ITS Scorecard Dashboard
  - New Dashboard Interface to Remedy Database
  - Features
    - Spotlighting of Actual v . Goal
    - Drill-down
    - Trending (Up/Down and Rolling)
    - Alerts/Notification
    - Consistency of Delivery and Format
    - Etc…
- Technologies
  - SharePoint 2007
  - MS Office 2007
  - Visual Studio 2005
  - MS SQL Server 2008
  - Etc…

Team 05. Motorola
Project Overview

User Generated Video Service for the iPhone
- User Videos from iPhone to Home TV
  - Users Generate Videos
    - Capture with iPhone
    - Upload from iPhone to Service
  - Family and Friends View Videos
    - On Home TV
    - Using Cable TV Set Top Box (STB)
- Software Components and Features
  - RESTful Video Services
  - Video On Demand (VOD)
  - Social Networking
    - Allow Friends to View Videos
    - View Friends' Videos
  - Cable TV Set Top Box (STB) Interface
- Technologies
  - iPhone Development   - AJAX
  - RESTful Web Services - Advanced Java and JEE
  - Multimedia Development   - Video on Demand and Other Cable Services
  - Databases   -Objective C, Object Oriented Design

Team 06. TechSmith
Project Overview

Microsoft Team System Custom Client
- Microsoft Team System
  - Application Life Cycle Management Tools and Processes
  - Integrated Into Visual Studio
  - Too Limited for TechSmith Environment
- Create Custom Team System Client
  - Support Multi-Platform Applications
    - Windows
    - Mac
  - Support Multi-Disciplinary Teams
    - Software Engineers
    - User Experience Designers
    - Test Specialists
    - Information Developers
    - Project Managers
- Technologies
  - Microsoft Visual Studio
  - Microsoft Team System 2008 and the Team Foundation Server
  - Microsoft Silverlight
  - SCRUM Agile Development Methodology
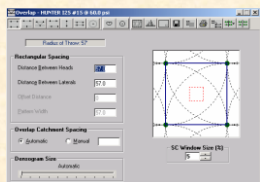 - Etc…

Team 07. Toro
Project Overview

Irrigation Distribution Uniformity Analysis
- Irrigation Nozzle Development Testing
  - 20' x 20' Grid Centered on Test Nozzle
  - Water Collection Pressure Sensors at Each Grid Point
- Existing System
  - Data Stored in Comma Separated File
  - Analyzed Using Space Pro Software
- Proposed System
  - Custom Web-Based Analysis Tool
  - Data Stored in Microsoft Access
  - Automatic and Manual Modes
  - Features
    - Edit Datasets
    - Display Graphs and Statistics
    - Profiles
    - Etc…
- Technologies
  - Visual Studio 2008
  - Microsoft Access
  - LabVIEW
  - Etc…

Team 08. Urban Science
Project Overview

Automobile Dealership Dashboard
- Urban Science Products
  - For Automobile Dealerships and OEMs
  - Tools to Analyze Operational Performance
  - Vitally Important in Current Economy
- Dealership Dashboard
  - Portal to Urban Science Products
  - Modern Dashboard Graphical User Interface
  - Easily Customizable
  - Include Text, Charts, Graphs, Gauges, etc…
  - Utilize Integrated Site Solution (ISS)
  - Maintain Urban Science Brand Image
- Technologies
  - Microsoft Visual Studio
  - Web 2.0
  - Integrated Site Solution (ISS)
  - ChartFX

First Assignments

- Read the Syllabus
- Check out the Lab
  - See if you can find it.
  - See if you can get in.
- Check out the Web Site
- Research Clients

What's Next?

- Teams
  - Assignments by Email Tonight
  - Meet Initially by Thursday Afternoon
  - Get Lab Machine Assignments from Matt
  - Start Configuring Lab Machines
  - Pictures Next Week After Meeting
- Client
  - Contact by Email by Thursday Afternoon
  - Contact by Phone Thursday or Friday
  - Review Project Proposal

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➢ Course Logistics Continued

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Expectations & Workload

- Extremely High For Both
- Your MSU Career Capstone
- Addition to Your Personal Portfolio
- View Like an Internship
- Interview Talking Points
- Leverage Into a Job Offer

Meeting Attendance

- Required
  - All-Hands (Class) Meetings
  - Team Triage Meetings
- 5% of Final Grade
- Late == Absent
- Almost No Excuses Accepted
  - One or Two Excused Possible for Interviews
  - Must Provide Information In Advance
    (Date, Company, Recruiter Name & Contact Info)
- Must Attend (No Excuses Accepted)
  - Your Team Presentations
  - All Final Project Video Viewing ⎤ Do NOT Schedule Interviews
  - Design Day

Team Organization

- Up to Each Team
- Organize into Roles
  - Client Contact
  - Program Manager
  - Developer
  - Tester
  - Systems Administrator
  - Web Master
  - Etc…
- Everyone Must Make Technical Contributions

Team Dynamics

- Key to Success
- Significant Component of Course Grade
- Address Problems Immediately
  - Within Team
  - With Dr. D. and/or Matt
- Be Ready to Discuss During Interviews

Grading (1 of 3)

- Team (70%)
  - Project Plan Document & Presentation   10
  - Alpha Demonstration   10
  - Beta Demonstration   10
  - Project Video   15
  - Project Software & Documentation   15
  - Design Day   5
  - Team Web Site   5
                                            ──
                                            70
- Individual (30%)
  - Technical Contribution   10
  - Team Contribution   10
  - Team Evaluation   5
  - Class Meeting Attendance   5
                                            ──
                                            30

Grading (2 of 3)

- Final Grade Sum Of…
  - Individual Grade
  - **Percentage** of Team Grade Based on Team Contribution
- Individual Total Grade =

  (Individual Grade)

  +

  (Team Grade) * (Team Contribution) / 10.0   ─ **N.B.**

- Nota Bene: **Your Team Contribution will have a very significant effect on your final grade.**

Grading (3 of 3)

- We reserve the right to make changes with sufficient notice.
- No special consideration will be given for final grades including but not limited to
  - status in any academic program including CSE,
  - financial aid,
  - rank in the armed forces,
  - job,
  - graduation,
  - mortgage,
  - wedding, or
  - visa status.

Integrity of Scholarship

- MSU's policies will be enforced.

- Individual and team work must be original.

- Violators…
  - Will be referred to the appropriate deans.
  - May receive a grade of F in the course.

Using Resources

- Ok For "Help"
  - People
    - Past Capstone Teams
    - Other Capstone Teams
    - Faculty Members
  - Articles
  - Sample Code
  - Etc…
- Not Ok For "Entire" Project
- If Unsure, Ask Dr. D. and/or Matt

Using Existing Code

- Ok
  - Examples
  - Prototypes
  - Open Source Code
    - Fragments
    - Libraries
    - Utilities
- Not Ok
  - Vast Amounts of Your Project
  - Not Open Source
- Document and Report All Existing Code Used
- Be Careful!
- If Unsure, Ask Dr. D. and/or Matt

Design Day

- College of Engineering Event
  - MSU Union
  - Friday Morning, December 11
- Displays (Booths) of Design Projects
  - CSE Capstone
  - ECE Capstone
  - ME Capstone
  - Etc…
- Presentations and Awards
  - Panel of Judges
  - CSE Team Project Videos

VISA

- Verified Individualized Services and Accommodations

- Let us know **immediately**.

- We will work with you.

Office Hours

- Any Time…
  - Visit
  - Call
  - Send Email
- Make Appointment

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