Research & Development of Mobile Interaction Systems

RESEARCH PROJECT PLAN

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Loyola University Chicago

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Goals

1. Prepare class materials
   1.2. Develop projects for students of the new class “Software Development for Wireless and Mobile Devices”
       1.2.1. Project Description
       1.2.2. Starting Point Software
       1.2.3. Sample Full Solution
   1.3. Develop and locate other class items
2. Design and write Project Proposals for Grants
   2.1. Mobile applications for use in a university
   2.2. Build on previous Project Proposals and ideas, such as the "SBC Excelerator"
   2.3. Write some proposals
       2.3.1. SBC Excelerator proposal re-do (re-design and submit again)
       2.3.2. Few-page preliminary proposal for Microsoft (Proof of Concept)
       2.3.3. TBD (to be determined)
2.4. Investigate and generate ideas and concepts concerning Architecture and Events for the interactive engine
   2.4.1. Server event dispatcher
   2.4.2. Client event dispatchers
   2.4.3. Intermediate layer - event filter that packages events for delivery to a selection of specific types of recipient devices, transforming them according to device peculiarities; 'push' and 'pull' approaches
   2.4.4. Multimedia support
   2.4.5. Use of XML & WML markup languages in event format
2.5. Index related papers and resources to reference in proposals

3. Discover and keep track of the following item categories:
   3.1. Bibliography - in IEEE format
       3.1.1. Books
       3.1.2. Research papers
       3.1.3. Data format specifications
   3.2. Unpublished and online-only documents
       3.2.1. Existing project proposals that have won or failed, and why
       3.2.2. Information on online forums and newsgroups
   3.3. Code and software
       3.3.1. Development tools
       3.3.2. Addons and upgrades for development tools
       3.3.3. Third-party software and code

Schedule

We will meet weekly to work together and review progress. Planned meeting time: 2:30 Wednesdays, starting 18 Jan 2006.

Description: The schedule is 2-weekly, i.e., there is a task for every two weeks
Time period format: Weeks  Date - Date

01, 02  12/19/05 - 12/30/05
   - Gain familiarity with Visual Studio 2005 installation and add-on SDKs / patches required for developing mobile applications
   - Pick the proper subset of virtual device emulators according to the target runtime environments (2 or 3, one with keyboard and one without possibly)
   - Write and run a simple "Hello World"-like application.
   Deliverables:
   - A manual for easy installation of selected components of the framework for class use
   - First course project like the classical "Hello World" application

03, 04  01/02/06 - 01/13/05
- Start searching for & indexing Bibliography on the base of context (implicit in all further 2-weekly tasks). Grows from here on.
- Understand the "M! Coupon" program written by Sunghye
- Extend Sunghye's work and / or develop trivial software to gain more familiarity with the framework

**Deliverables:**
- Second course project for class with full implementation (sample solution)
- Second course project for class with full implementation (sample solution)
- update on Bibliography

**05, 06 01/16/06 - 01/27/06**
- Decide to use or make a new Research Group name
- Look at existing Project Proposals to get to know what they really are, ask people who know
- Propose class study topics
- Identify broad class study and project area (may overlap with the area of Project Proposals)
- Come up with an idea for a Proof of Concept proposal for Microsoft and work on it.

**Deliverables:**
- a new Research Group name
- Several suggestions for more advanced class projects and research ideas for grant proposals
- Diagram and 2 page description of overall architecture for selected application area
- update on Bibliography

**07, 08 01/30/06 - 02/10/06**
- Start to develop a Project Proposal for a University Mobile Interaction System (code name) based upon the previous proposal "SBC Excelerator"
- Outline a few class projects of increasing complexity overlapping with subtasks of potential Project Proposals as their elementary building blocks
- Complete the Proof of Concept proposal for Microsoft

**Deliverables:**
- Outlines of the Proposal for a University Mobile Interaction System
- Outline of the class projects
- Proof of Concept proposal for Microsoft completed
- update on Bibliography

**09, 10 02/13/06 - 02/24/06**
- Implement some elementary building blocks as class projects and as the starting baseline for projects
- Most important:
  - Universal Event Format (alpha version)
  - Universal Event Dispatchers (alpha version)

**Deliverables:**
- Code of the alpha implementation of class projects / project building blocks
- update on Bibliography

11, 12 02/27/06 - 03/10/06
- Test & fix the implemented modules
- Document the implemented modules as both
  - elements of proposed design
  - class tasks
- Improve the Project Proposal for the University Mobile Interaction System, adding new, more detailed, information

Deliverables:
- Fixed code of class projects / project building blocks (modules)
- Descriptions of implemented modules to include in proposals
- Tasks for making the modules, the latter being sample solutions, for the class
- Preliminary version of the Proposal for the University Mobile Interaction System - actual proposal or ready-to-use pieces
- update on Bibliography

13, 14 03/13/06 - 03/24/06
- Synchronize with Dr. Honig on developing further class materials
- Investigate possibilities of Encryption Support for (our) Mobile Interaction Systems
  - public-key algorithms
  - encrypted version of the event format
  - encrypting multimedia
  - digital signatures
  - support for mobile anonymity or pseudonymity
  - investigate traceability peculiarities (technical limitations on privacy)
- Security considerations for the University Mobile Interaction System

Deliverables:
- Encryption Support & Privacy component of the Proposal for the University Mobile Interaction System
- Outlines and draft descriptions of any further class materials
- update on Bibliography

15, 16 03/27/06 - 04/07/06
- Complete preparing course materials
- Complete the proposal for the University Mobile Interaction System

Deliverables:
- Course materials complete on web (the website will use PLONE)
- Proposal ready for submission
- update on Bibliography

17, 18  04/10/06 - 04/21/06  
- Start working on a proposal for developing an edition of the University Mobile Interaction System for an _online_ university  
  - define surplus and overridden requirements  
  - define metadesign changes  
Deliverables:  
  - Draft of the proposal for developing an edition of the University Mobile Interaction System for an _online_ university  
  - update on Bibliography

19, 20  04/24/05 - 05/05/06  
- Finish the proposal for developing an edition of the University Mobile Interaction System for an _online_ university  
  - Investigate possibilities for a proposal on using Mobile Interaction for a virtual software development workgroup  
  - Team Software Process (TSP) -driven work synchronization gone mobile  
  - Organize Bibliography  
Deliverables:  
  - Proposal for developing an edition of the University Mobile Interaction System for an _online_ university complete  
  - Outline of ideas on the Mobile Interaction System for a virtual software development workgroup  
  - Organized Bibliography

Textbooks, Project Materials, etc.

- Microsoft Visual Studio 2005 development environment with appropriate add-ons for developing mobile software  
- Fox, Dan; Box, Jon. Building Solutions with the Microsoft .NET Compact Framework. Architecture and Best Practices for Mobile Development. 0-321-19788-7, Addison Wesley, published October 2003  
- Wigley, Andy. Microsoft® .NET Compact Framework (Core Reference). 0-7356-1725-2, Microsoft, published 01/22/2003  
- TBD (to be determined in the course of work)