Spring 2014 – Distance Learning Class

COT 6930 – Android Components

Course Syllabus: Software component development for Android or other Apps, with UML using EMF for autocode generation.

Text: EMF Eclipse Modeling Framework, 2nd edition, by D. Steinberg, F. Budinskly, M. Paternostro, and E. Merks, Addision-Wesley, 2009.

Reference: Android for Programmers - An App-Driven Approach by Paul Deitel et al., Prentice Hall, 2nd edition, ISBN-10: 0133570924, Jan 2014

Pre-requisite: Java and XML.

Instructor: Ravi Shankar, Professor and Director, CSI, CEECS

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Office Hours: 9 AM to 3 PM Friday

Course Time and Place: MW 2 to 3.20 PM, Distance Learning class, CM 128

Course Description: The course will explore ways to develop Android or other applications rapidly. Android provides substantial support. The course will attempt to go further in taming the complexity and facilitating application development. Complete application development is not a goal here. You have two options: (1) You will be given existing Apps; your responsibility is to use them to understand the use cases for a given Android component; or (2) You will be given the specifications of a simple stand-alone App. Use that information to develop specifications for that component/App and to implement using UML class diagrams. A MVC (model-view-control) Java application is then rapidly and automatically developed using open source EMF (Eclipse Modeling Framework). The final report will show how your code will replace the code (for that component) for any given App and still execute properly.

SDK kit and emulation will be used initially in the course. Nexus 7 tablets supporting Android 4.3 are available for testing. Android smart phone App development will be covered in the first three weeks of the semester. Other Application domains will be covered/ highlighted in the class.

Quizzes (3) 33% (on background material)

Midterm Exam (around week 6) 33% (on background material; take home exam)

Final Project Report 34% (Report with screen captures; simple App)

Bonus: Professional Community Help 10% (via blogs, tutorials & links)

Note: Live class students must attend the classes and help make sure the material covered is useful for remote students. Bring your laptop and try out the class items so I can respond to any problems/issues. These students will do only two quizzes.

Topics to cover:

1. Background Material: Brief Intro to Android (6 lectures)
2. Background Material: Introduction to Eclipse Modeling Framework (3 lectures); A working example.
3. Model Editing with EMF.Edit (4 lectures)
4. Ecore Modeling Concepts (3 lectures)
5. Component: Requirement analysis, engineering specifications, and modeling with UML class diagrams (2 to 4 lectures)
6. Java, UML, and XML mapping to Ecore (4 lectures)
7. EMF and EMF.Edit Generator Patterns (3 lectures)
8. Putting it all together: EMF for code generation and a working example (3 lectures)
9. Project: This will be based on your background and interest, and your group size (one or two members). Possible projects: (1) In Android: Bluetooth, GPS, Camera, UI, Multi-threading, SQLite, Mapping, and 2D & 3D graphics; (2) In other areas: education, health care, and big data.