Web Testing

- Web testing is............
  - Well, testing web apps.
  - Important. Many projects in 838M
  - Paper has super value.
  - Three brand new perspectives
    - For the price of one paper

What’s the big deal ?

- Object Oriented. We love objects.
  - Web app = Objects + Relationships.
- Behavioral.
  - Navigation between objects.
- Structural.
  - Control and data flow in app.

So ?

- Automatic Systematic Testing
  - Structural as well as Behavioral
- Object Oriented = Many Objects
  - Each object its own tests. Use OO testing.
- Ripple Effect in Regression Testing.
  - Only object modified and those it affects.

Existing Stuff

- ER model used for Design
- WOOM for Development
- Web-Composition using XML
- If XML, why not UML ?
- This paper extends traditional testing.

The Test Methodology

- Get instance model from
  - Forward Engineering
    - From Requirement Specs
  - Reverse Engineering
    - Analyze source documents from Implementation
- Gives both Structure and Behavior.
Fancy Names Used
- Change Ripple Effect Identifier
- Test Execution Scheduler
- Test Case Management System
- Test Data Composer
- Test Coverage Recorder
- Test Result Analyzer

The Object Perspective
- An Object Relationship Diagram
- Client pages, Server pages, Components.
- \((V,E,L)\), where \(L\) is the set \((V \times V \times E)\)
- New relationships for navigation
  - Apart from routine OO stuff
  - Request, Response, Navigation, Redirect.

The Behavioral Perspective
- Page Navigation Diagram (PND)
  - FSM. Pages = States. Hyperlinks = trans.
  - Constructed from ORD.
  - Iterative Algorithm for creation.
  - Dynamic Pages, handled by guards.
  - Create ST from PND.
  - Use to generate test cases. Whew !!!
Behavioral Persp. Contd.

- Object State Diagrams (OSD)
  - Dynamic State (e.g. user choices)
  - Use Hierarchical Composed Synchronized Communicating Finite State Machines
    - Mercy please !!!
  - Compute the COSD Graph. Generate Tree.
    - Given tree, get test cases.

Structural Perspective

- Web apps horribly complex.
  - Whither structure?
- Block Branch Diagrams (BBD)
  - Traditional testing for each function
- Functional Cluster Diagrams (FCD)
  - Used to model inter-procedural structure.
And…
- Constraints
  - Typically due to security
  - Specify as first order predicate logic
    - Example: Inactivity exceeded some time, Log user off.

Big picture
- Modeling web apps from three perspectives
- Once this is done, can generate test cases

Using WWW blah blah blah...
- As usual, the web is important.
- Client compliance to standards
- HTML: Levels 0,1,2,3,
  - In practice, nobody conforms.
  - Develop their own extensions.
  - “This site is best viewed with Netscape 9.8765”

So?
- WWW test pattern
- Active Tests
- Passive Tests
  - FINALLY…………………………

Moral of the story
Give the Devil its due
Use Microsoft PowerPoint

Merci Beacoup!