AJAX

Lecture 23

CS 638 Web Programming

Core AJAX technologies

- Using JavaScript and DOM manipulation to build interactive pages that "feel" more like desktop applications
- Asynchronous requests to web server to retrieve data needed to rebuild portions of the page
  - Using XML-based web services

Building "desktop-like" pages

- Use visual metaphors common to desktop apps
  - Drag-and-drop
  - Buttons for closing and minimizing widgets
  - Tabs
  - Tooltips when mouse moves over a page element
- Make elements behave more like three-dimensional objects in the real world
  - Shadows and "lighting effects" using images and CSS
    - The `z-index` CSS attribute controls stacking of elements
  - Transparency
  - Fluid motion

Fluid motion

- Real-world objects rarely change speed suddenly (collisions are an exception)
- Acceleration/deceleration gradually changes speed and/or direction of movement
- Can achieve fluid motion of animated page elements by gradually changing their speed

Tooltips

- Small boxes with explanations or details that appear when the user moves the mouse over a page element (button, link, etc.)
- Can contain text, images, links, etc.
- Often implemented by dynamically building a new div and positioning it close to the element triggering the tooltip
- Can build your own or use existing implementation
  - Reusable code available for many AJAX techniques

Common AJAX problems

- Effects that do not work in some browsers
- Unlinkable pages
  - How does the user return to the information currently displayed by browser (some of which was retrieved with asynchronous requests after the page loaded)?
- Pages that cannot be indexed by search engines
- Code bloat
  - If you end up with too much JavaScript the page may become slow to load or use too much memory
- Unexpected behaviors
  - No visual clues when page waits for asynchronous transfer
  - The back button does not work

Web 2.0 technologies

Segment 6

CS 638 Web Programming

Specific technologies

- Asynchronous requests from browser
- Web services
- Interactive pages and animation (JavaScript)
- XML
  - DTD
  - XPath
  - XSLT

Important concepts

- Structured data
  - Rules defining valid structures
  - Well-formed vs. valid XML documents
- Remote procedure calls
  - Encoding and transferring parameters and results between programs written in different languages and running on different computers
- User-interface metaphors and behaviors should conform to user expectations
  - User expectations shaped by conventions and user's experience with physical world objects