Elision Based Text Zooming

Project Update
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Motivation

• Computers make a lot of things easier
• Reading with computers
  – The Web
• Is reading easier online than on paper?
  – Reading online requires scrolling
  – Scrolling is hard: Either
    • Scroll too quickly to read the text, or
    • Take forever to find what you’re looking for
Scrolling

• Easier than turning pages in a book?
• Page Up & Page Down
Idea

- **Beginnings** of paragraphs are most important
  - Pre-reading
- **Hide** everything else
- Give users **control** over what is hidden
- **Remember** the user’s choices
Idea in Detail

- Control “zooming” and scrolling with the mouse
- Hide/show paragraphs a line at a time as zoom increases/decreases
- When zoomed out, display clicked paragraphs in full
- Visually mark clicked paragraphs
Other Approaches

• Zoom out by making text smaller
• Multi-scale Table of Contents
• Source code folding
Dataset

• World Wide Web
  – News Articles
  – Academic Papers
  – Online Books
Implementation

• Extension to Firefox Web Browser
  – JavaScript
  – XML DOM transformations

• Visual Feedback:
  – Dynamically modify page
  – Draw zooming/scrolling widget in front of page
my field? Do I have the right to banish it from my property? Am I allowed to enter into an exclusive licence with Delta Airlines? Could we set up an auction to decide how much these rights are worth?

In 1945, these questions became a federal case. When North Carolina farmers Thomas Lee and Timmie Causby started losing chickens because of low-flying military aircraft (the terrified chickens apparently flew into the barn walls and died), the Causbys filed a lawsuit saying that the government was trespassing on their land. The airplanes, of course, never touched the surface of the Causbys’ land. But if, as Blackstone, Kent, and Coke had said, their land reached to “an indefinite extent, upwards,” then the government was trespassing on their property, and the Causbys wanted it to stop.

The Supreme Court agreed to hear the Causbys’ case. Congress had declared the airways public, but if one’s property really extended to the heavens, then Congress’s declaration could well have been an unconstitutional “taking” of property without "[The] doctrine has no place in the modern world. The air is a public highway, as Congress has declared. Were that not true, every transcontinental flight would subject the operator to countless trespass suits. Common sense revolt at the idea. To
Challenges

• Determine what a **paragraph** is – more than one representation:
  – `<p>`
  – `<br>`
  – `<li>`
  – ...

Challenges (cont.)

- Find line breaks due to wrapping
  - Firefox documentation is incomplete
Challenges (cont.)

• Deciding what to hide
  – Beginnings of paragraphs important, but maybe the ends are as well
  – At some point, need to hide entire paragraphs
    • Which ones?
  – Treat long paragraphs differently than short paragraphs?
Challenges (cont.)

- User choices introduce compromise
Challenges (cont.)

• Not everything is plain text
  – Images
  – Tables
  – Lists
  – Formatting
Challenges (cont.)

• Zooming without Scrolling
Current Progress

- Learned how to write Firefox extensions
- Implemented framework for hiding and unhiding text
- Working prototype
  - Word-at-a-time zooming
  - Only handles <p> delimited paragraphs
  - No scrolling
  - No selection of paragraphs
Questions? Suggestions?