Elision Based Text Zooming

Project Update Sam Davis

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

Screen Shots

Zooming in on an excerpt from Free Culture by Lawrence Lessig:

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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?	Then came airplanes, and for the first time, this principle of American law—deep within the foundations of our tradition, and acknowledged by the most important legal thinkers of our past—mattered. If my	At the time the Wright brothers invented the airplane, American law held that a property Then came airplanes, and for the first time, this principle
In 1945, these questions became a federal case. When North Carolina farmers Thomas Lee and Tinie 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	In 1945, these questions became a federal case. When North Carolina farmers Thomas Lee and Tinie 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 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	In 1945, these questions became a federal case. When North Carolina farmers Thomas Lee and Tinie Causby started losing chickens because of The Supreme Court agreed to hear the Causbys' case. Congress had declared the airways public, "[The] doctrine has no place in the modern world. The air is a public highway, as Congress has declared. Were that not true, every
"an indefinite extent, upwards," then the government was trespassing on their property, and the Causbys wanted it to stop.	declaration could well have been an unconstitutional "taking" of property without	transcontinental "Common
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	"[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	This is how the law usually works. Not often this abruptly or impatiently, but eventually, this is how it works. It was Douglas's style not to dither. Other justices would have

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Challenges

- Determine what a paragraph is more than one representation:
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 - -

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- Find line breaks due to wrapping
 - -Hard? Easy? Don't know yet.
 - Firefox documentation is incomplete

- 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?

• User choices introduce compromise

- Not everything is plain text
 - Images
 - Tables
 - Lists
 - Formatting

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 delimited paragraphs
 - No scrolling
 - No selection of paragraphs

Questions? Suggestions?