**Question Examples: Poor**

- Well, what exactly Pad++ is? Is it a programming library or a set of API or a programming language? how can we use it in our systems, for example may be programming in TCL or OpenGL may be?
  - I learned some from this paper and got some ideas of my project.

**Question Examples: OK**

- This seems like something fun to play around with, are there any real implementations of this? Has a good application for this type of zooming been found? Is there still a real need for this now that scroll wheels have become prevalent and most people don’t even use the scroll bar anymore?
  - Playing with the applet, I find I like half of their approach. It’s nice to zoom out as my scroll speed increases, but then I don’t like the automatic zoom in when I stop scrolling. Searching the overview I found the location I wanted, but while I paused and looked at the overview, I fell back into the closeup. I think they need to significantly dampen their curve.

**Question Examples: Good**

- It would be interesting to compare the approach in this paper to some other less-mathematically-thought-out zoom and pan solutions to see if it is really better. Sometimes "faking it" is perceived to be just as good (or better) by users.
  - The space-scale diagrams provided a clear intuition of why zooming out, panning then zooming in is a superior navigation technique. However, I found the diagram too cumbersome for practical use, especially for objects with zoom-dependent representations (Figure 11).

**Question Examples: Great**

- I’m curious as to what would have happened if the authors had simply preselected the values of the free parameters for the participants in their user study, and then had the users compare their technique to the standard magnification tools present in a ‘normal’ application (much like the space-scale folks did). Could it be that the users are “manufacturing” a large standard deviation in the free parameter specifications by settling for values that merely produce a local improvement in their ability to manipulate the interface, instead of actively searching for an optimal valuation scheme?
  - In a related vein, the speed-dependent automatic zooming met with mixed success on some applications. Isn’t this success related to how “compressible” some information is? i.e. because zooming must necessarily throw out some information, it isn’t obvious which information to keep around to preserve the navigable structure.
Interactivity
▶ static images
▶ 10,000 years
▶ art, graphic design
▶ moving images
▶ 100 years
▶ cinematography
▶ interactive graphics
▶ 20 years
▶ computer graphics, human-computer interaction

Information Visualization
▶ visual representation of abstract data
▶ computer-generated, can be interactive
▶ help human perform some task more effectively
▶ bridging many fields
▶ graphics: drawing in realtime
▶ cognitive psych: finding appropriate representation
▶ HCI: using task to guide design and evaluation
▶ external representation
▶ reduces load on working memory
▶ offload cognition
▶ familiar example: multiplication/division

External Representation: multiplication
paper mental buffer
57
x 48
—-
456

——–
6

2
57
x 48
—-
456
228
——–
6
The text in the image is not fully legible due to the quality of the image. However, it appears to be discussing topics related to information visualization (infovis) and scientific visualization (scivis). Key points include:

- The effectiveness of visual representation of abstract data, such as reducing load on working memory.
- The need for design guidelines in creating effective visualizations.
- The importance of offloading cognition to visual systems for improved human performance.

The image contains diagrams and tables, likely illustrating various visual representations and their applications. The text references authors like Lewis Carroll and Hofstadter, discussing concepts like self-reflection and mental buffers. The diagrams show different visual representations, including topic graphs and automatic layout techniques.
Depth/Occlusion

High Dimensionality

Color

Evaluation

Interaction

Navigation/Zooming

Graphs/Trees

Some Guest Lectures Possible

▶ stayed tuned, things may shuffle

Office Hours

- domains
  - bioinformatics
  - evolutionary trees
  - genomic sequences
  - protein-protein interaction
  - computer science
  - networking
  - cluster/network monitoring
- techniques/projects
  - Focus+Context
  - multidimensional scaling
  - scalable graph drawing
  - evaluation
- 4-5 Wed after class, or by appointment
  - office in X661, ICICS/CS