

Übung zur Vorlesung

Informationsvisualisierung

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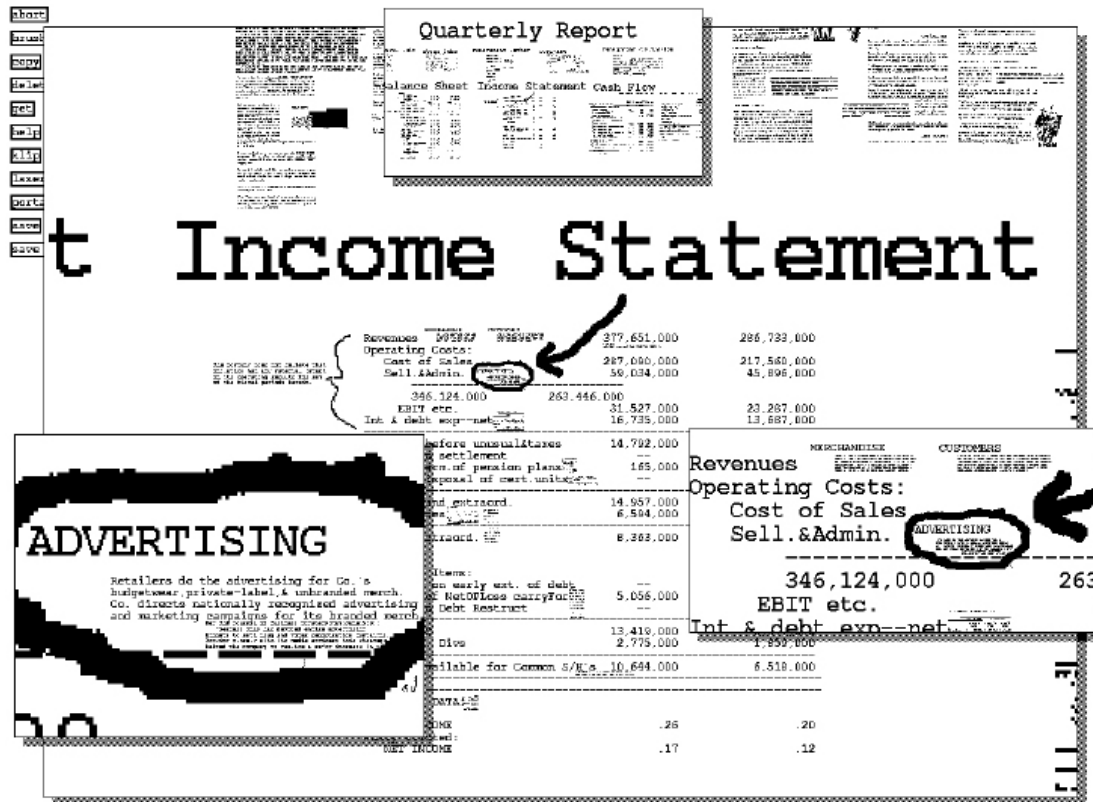
Presentation

Presentation Problem

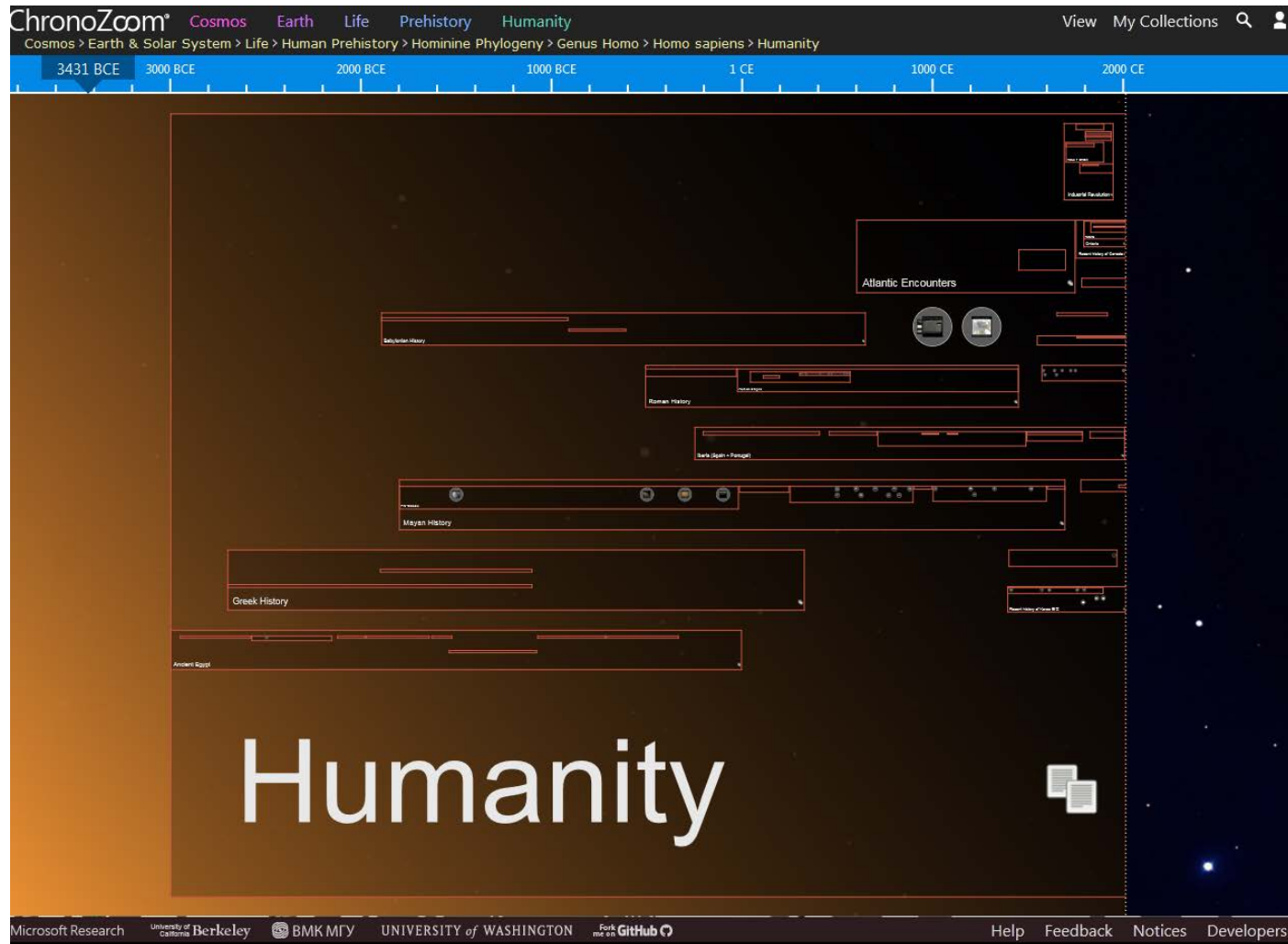
Zoomable User Interfaces

Zoomable User Interfaces

- “Pad, the first multiscale interface”



ChronoZoom [6]



<http://www.chronozoom.com>

ZUIs – Advantages [4, 5]

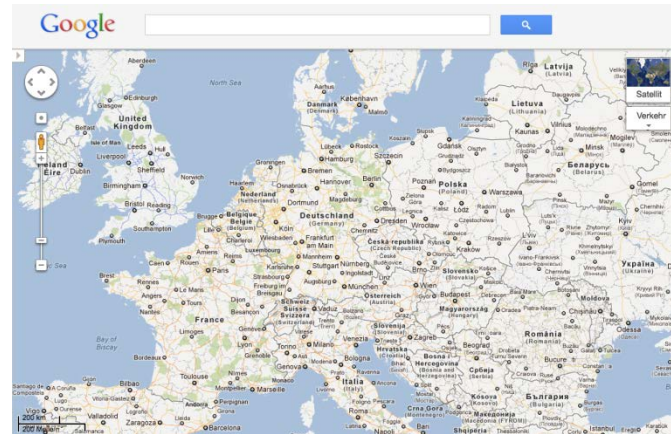
- Highly intuitive (direct manipulation)
- Unlimited information space
- Allows for spatial ordering of data
 - E.g. logical arrangements
- Adapt information depending on the zooming factor (semantic zoom)

Zoomable User Interfaces

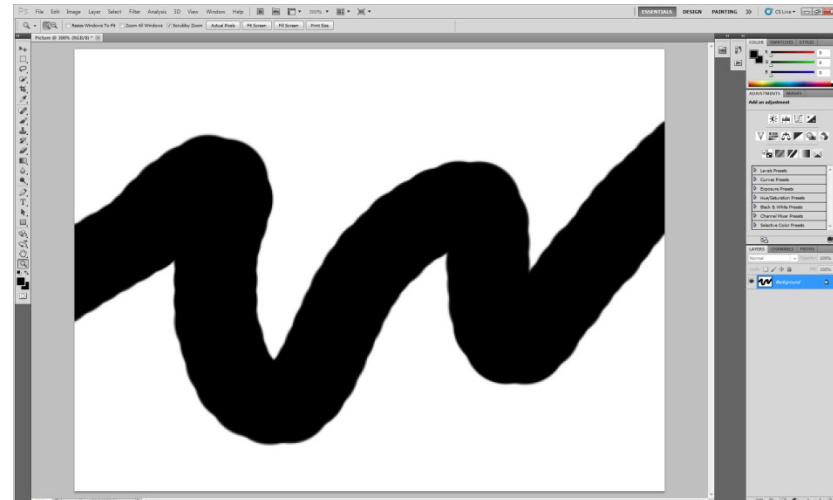
- They're already here!



Safari mobile

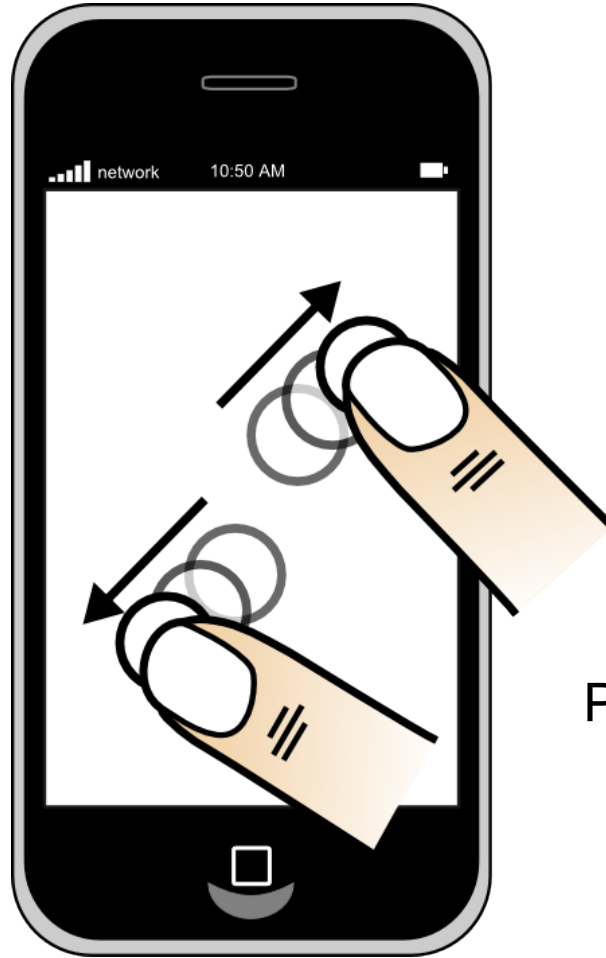


Google Maps



Photoshop

ZUIs on Touchscreens



Pinch gesture

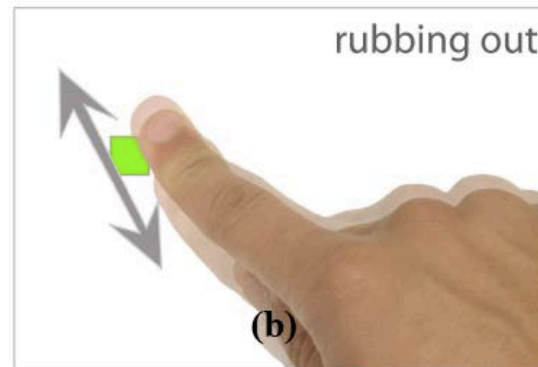
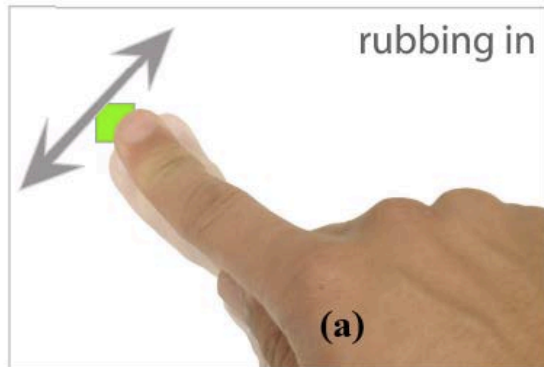
ZUIs on Touchscreens

- What if there is no multi touch?
- Zoom buttons
 - Problem:
 - Small screens with limited size
 - Occupy screen real estate
 - Cover information
 - Have to be big (fat finger problem)
- Double tap
 - Problem:
 - Only one step zoom



ZUIs - Interaction

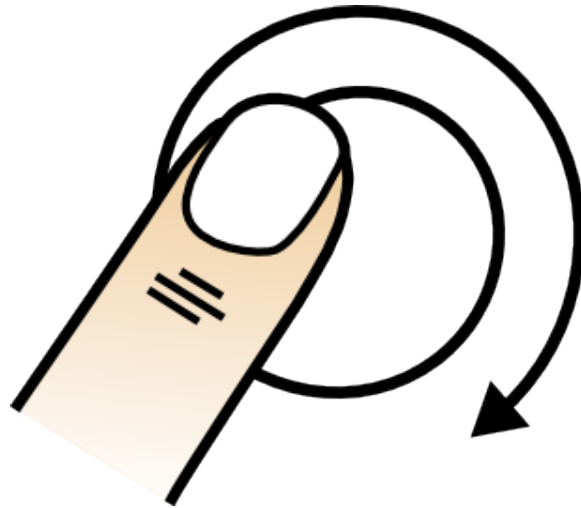
- Rubbing and Tapping [3]
- Problem:
 - How to differentiate it from panning?



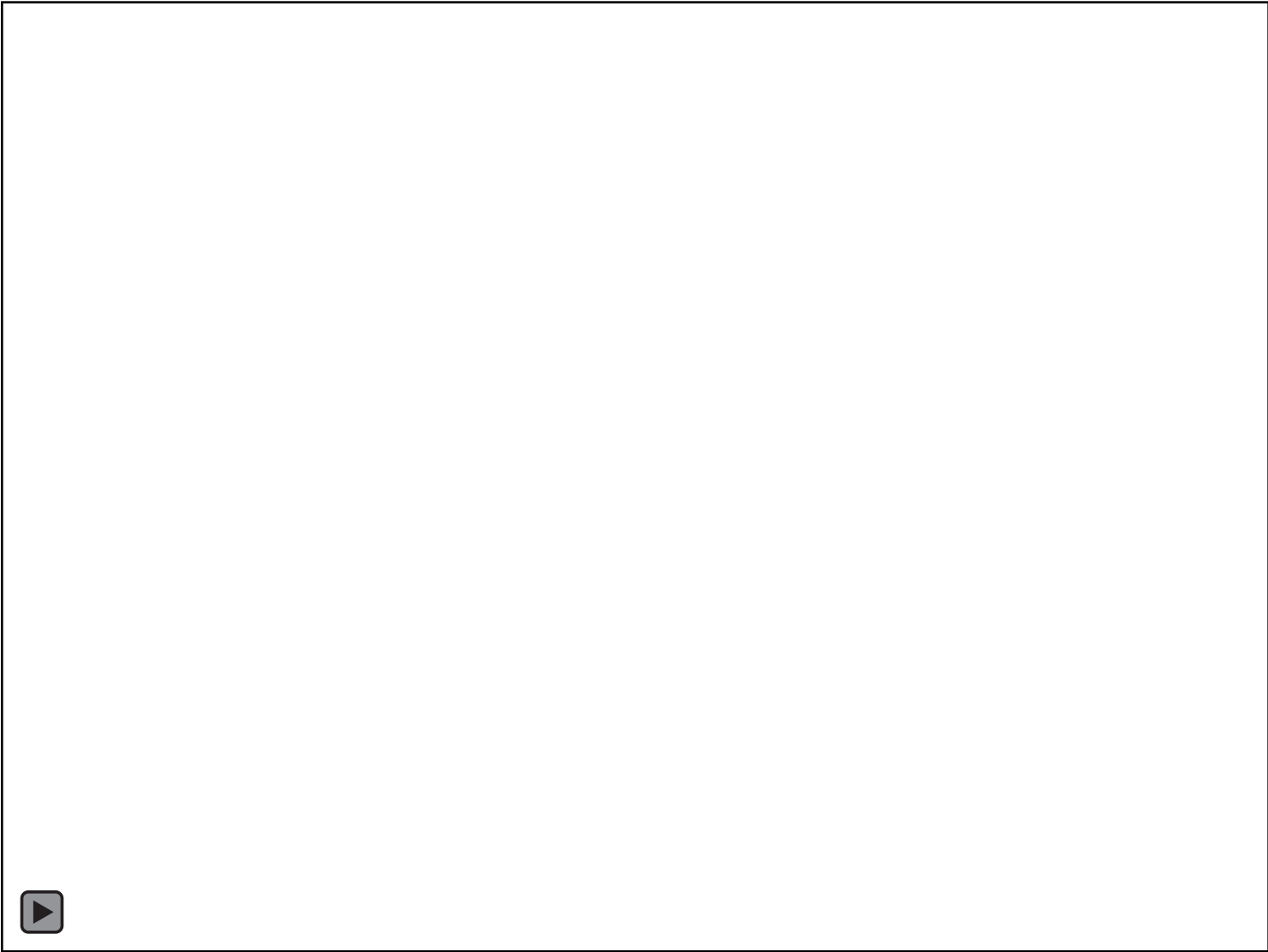
[3]

ZUIs - Interaction

- Circular touch, Nokia browser



ZUIs - Circular Touch



ZUIs - Problems

- Getting lost (**too far in**)

What is this?



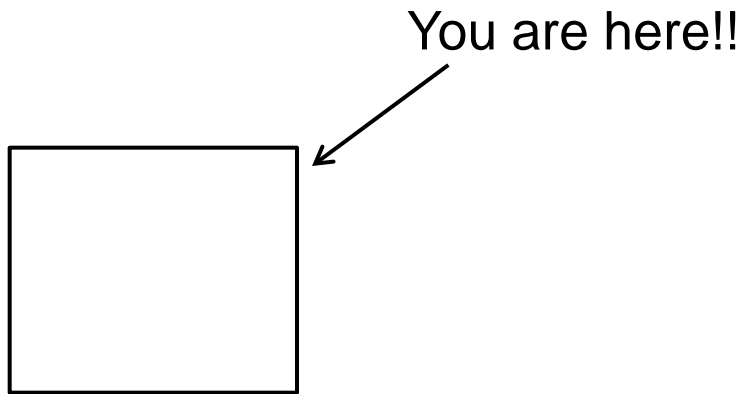
ZUIs - Problems

- Getting lost (**too far out**)

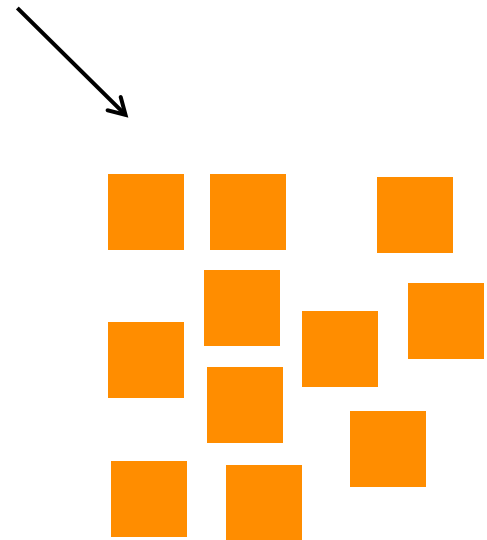


ZUIs - Problems

- Navigation

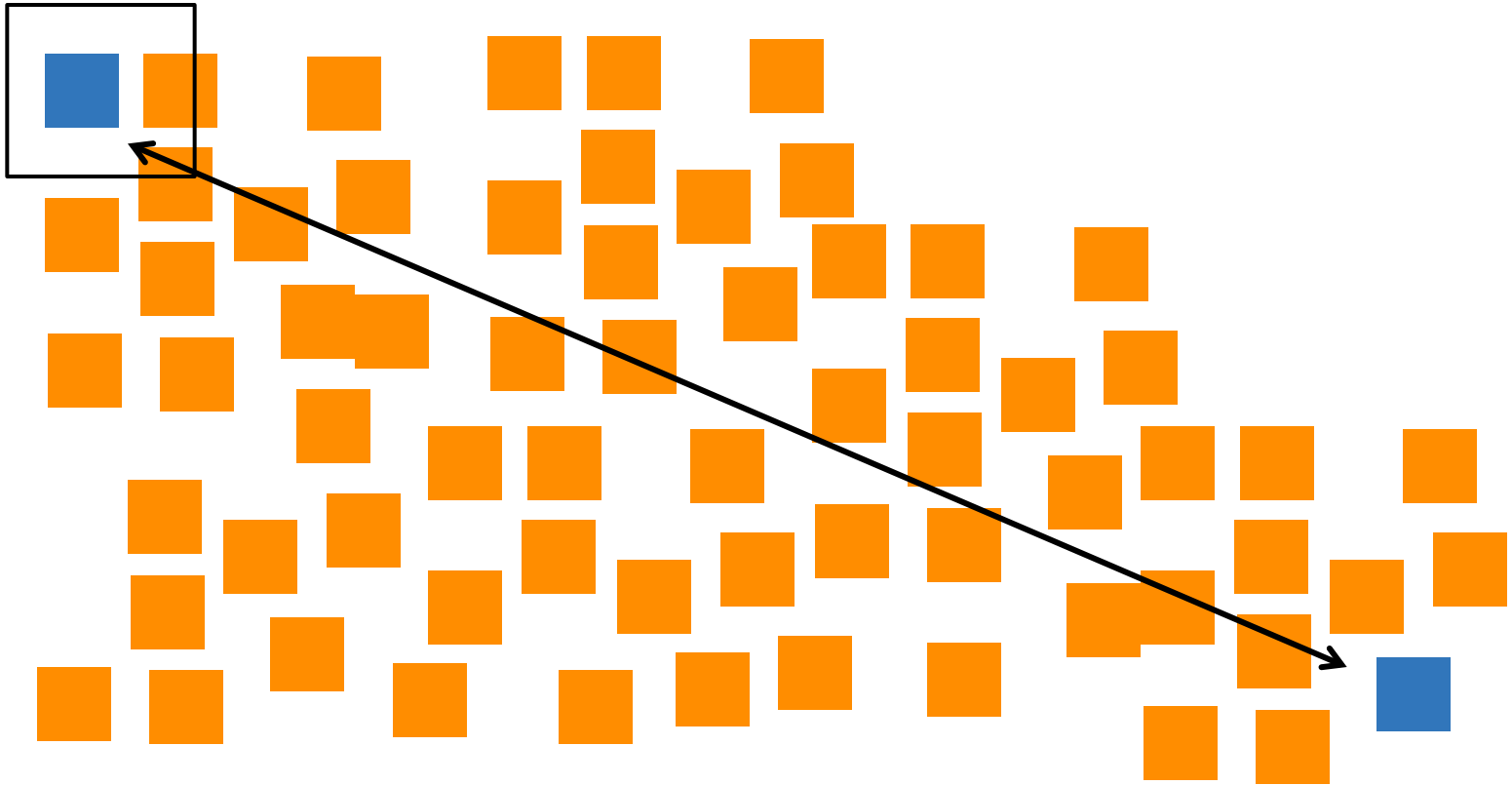


Your data is here!



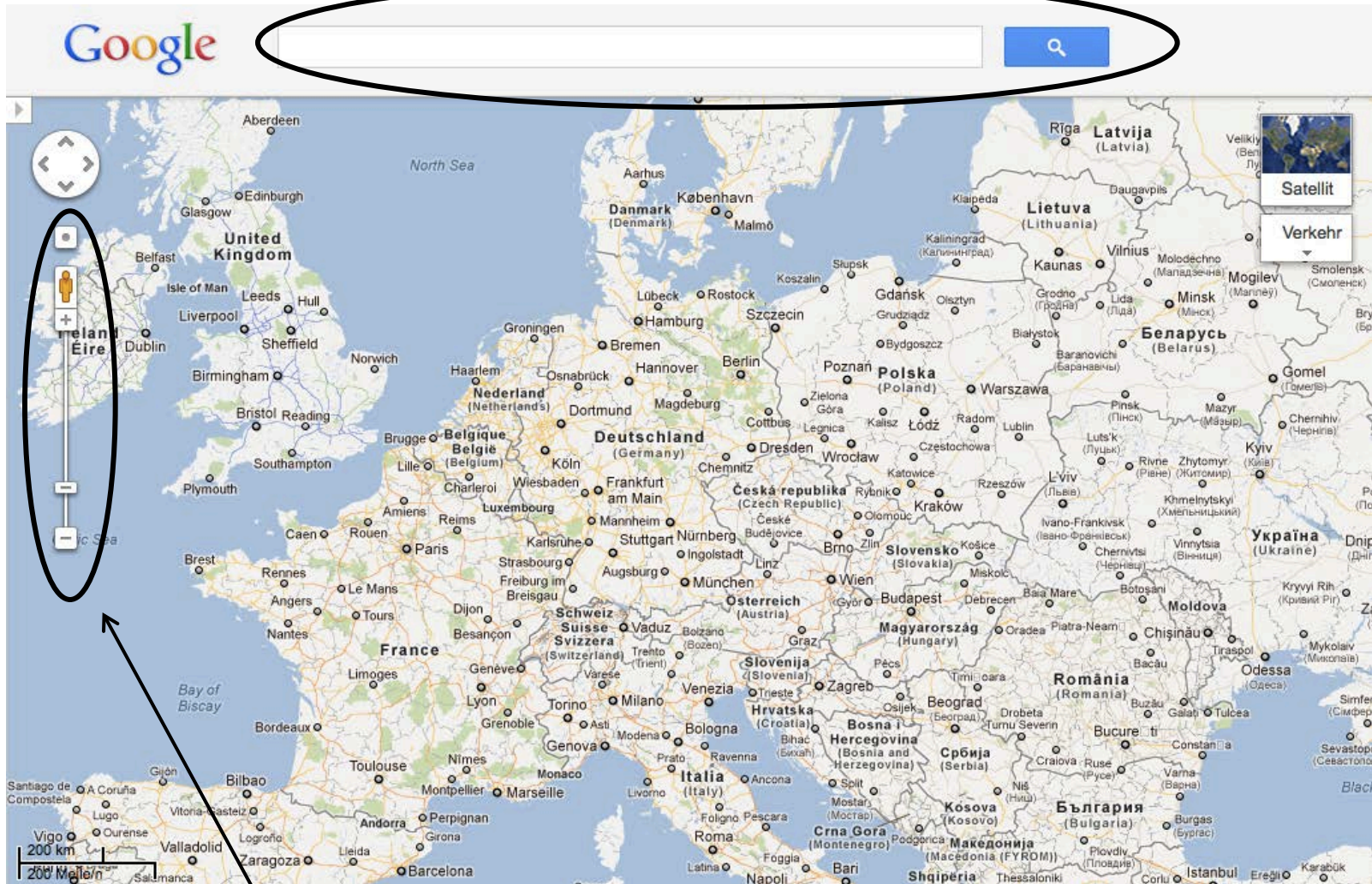
ZUIs - Problems

- Navigation



ZUIs – Some Solutions

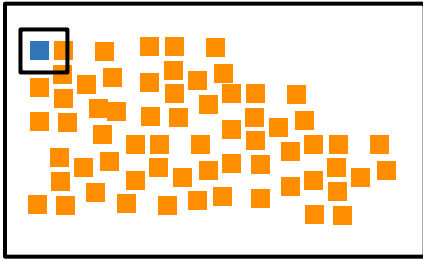
Search



Limit zoom factor and pan

ZUIs – Some Solutions

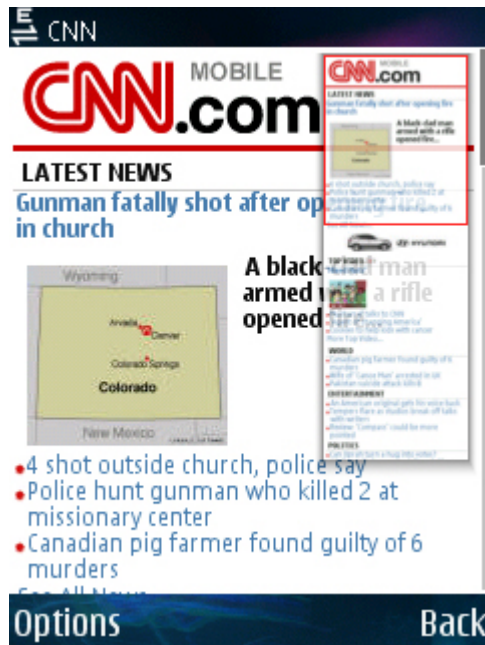
- Overview plus Detail (see later)



Overview + Detail Interfaces

Overview plus Details

- Show details of an information space together with an overview

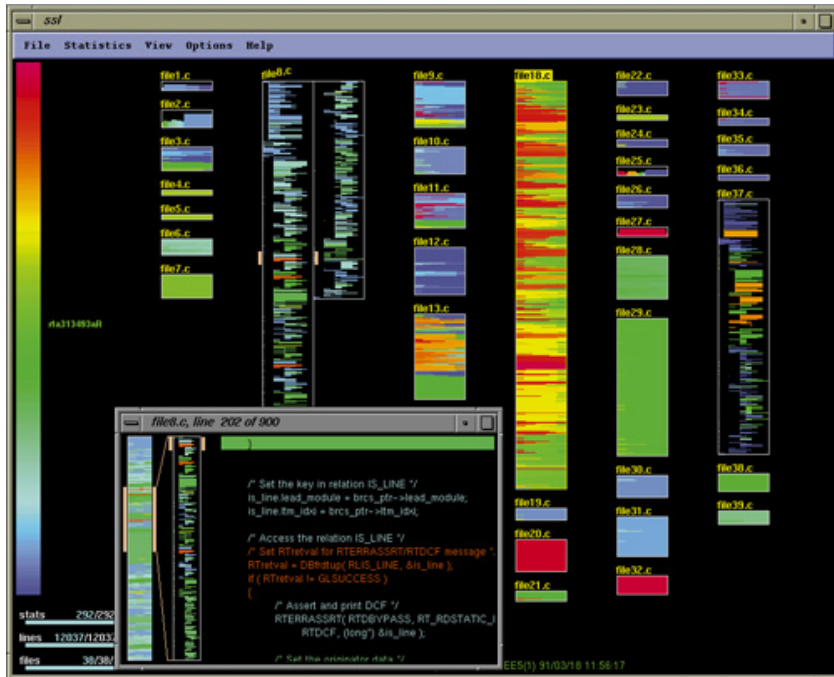


Nokia Browser © pocketnow.com

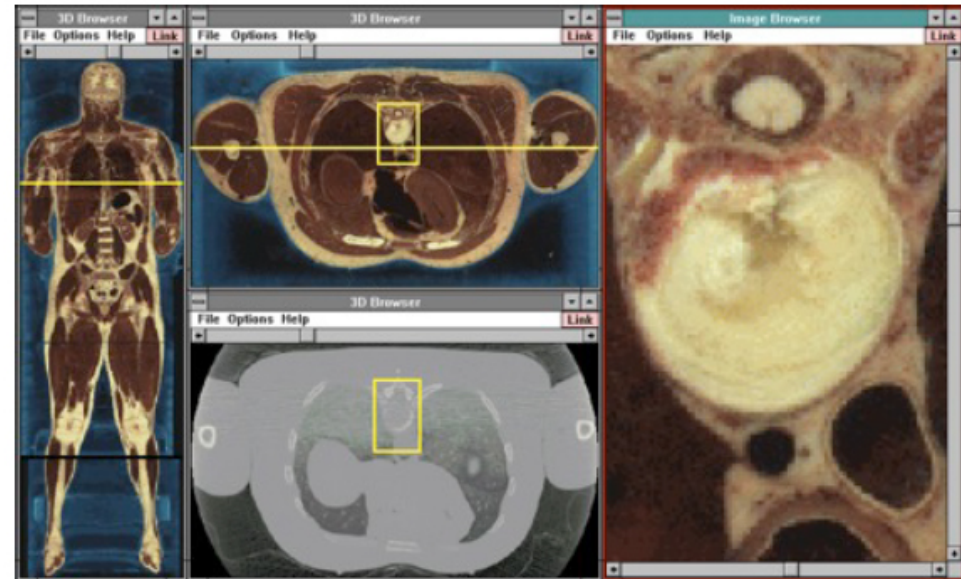


Google Maps

Overview plus Details



SeeSoft, Eick et al. ,1992 [1]



North & Shneiderman 1997

Overview plus Details

- Who invented it?



Dune 2, 1992
Source: Paranoid/Wikipedia

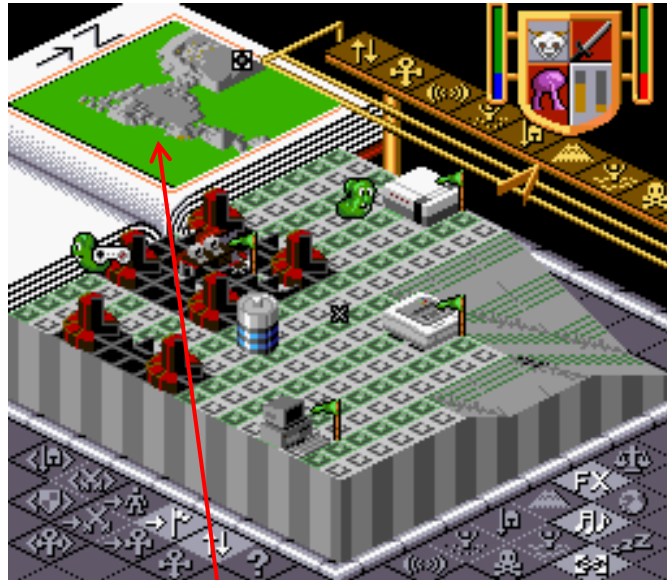


Super Mario Kart, 1992
Source: Wikipedia

Remember that SeeSoft [1] is from 1992 as well!!

Overview plus Details

- Some more years back...

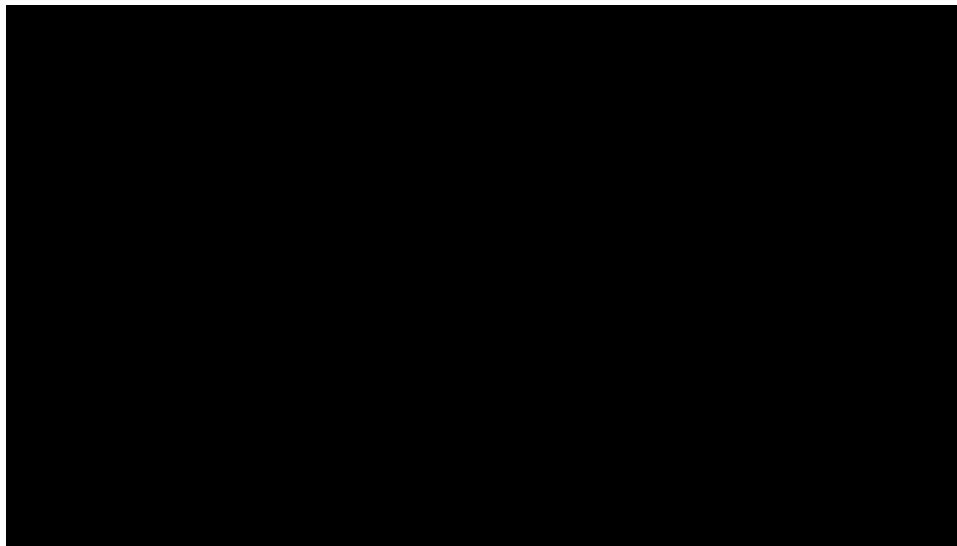


Populous, 1989

Source: MobyGames/Juan Ramirez

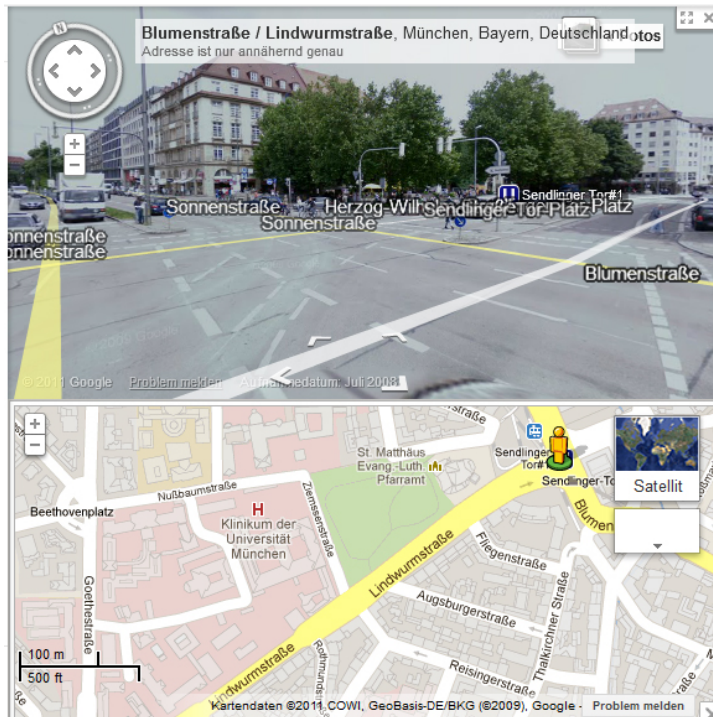
Overview plus Details

- Some more years back...



Populous, 1989
Source: MobyGames/Juan Ramirez

Overview plus Details



Google Maps



Super Mario Kart, 1992
Source: Wikipedia

Innovations

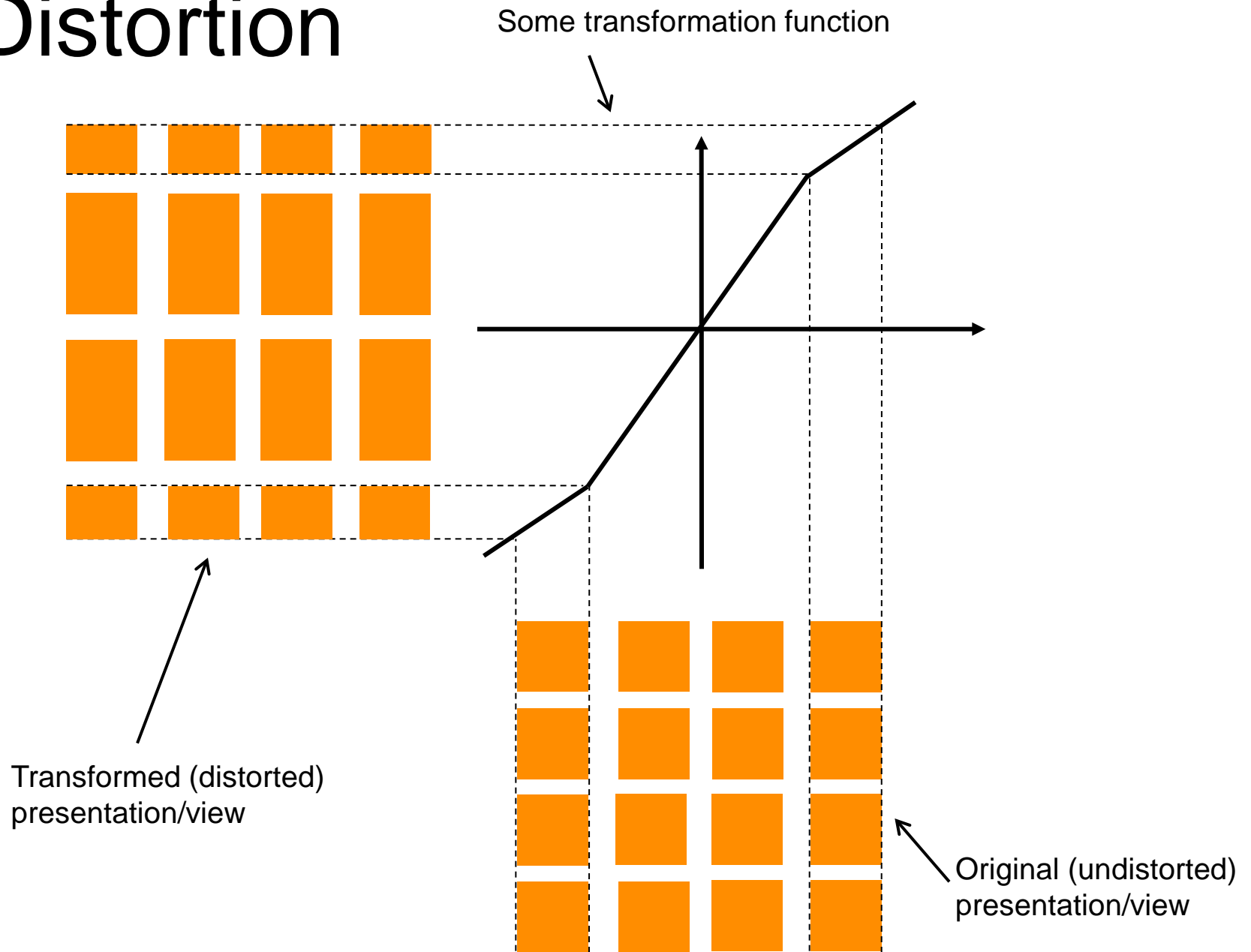
- It is not always clear where a specific approach comes from
- Innovation is often driven by commercial issues
- Game development is:
 - very competitive
 - always on the edge of what is possible
 - Highly innovative

Distortion (Focus + Context)

Why Distortion?

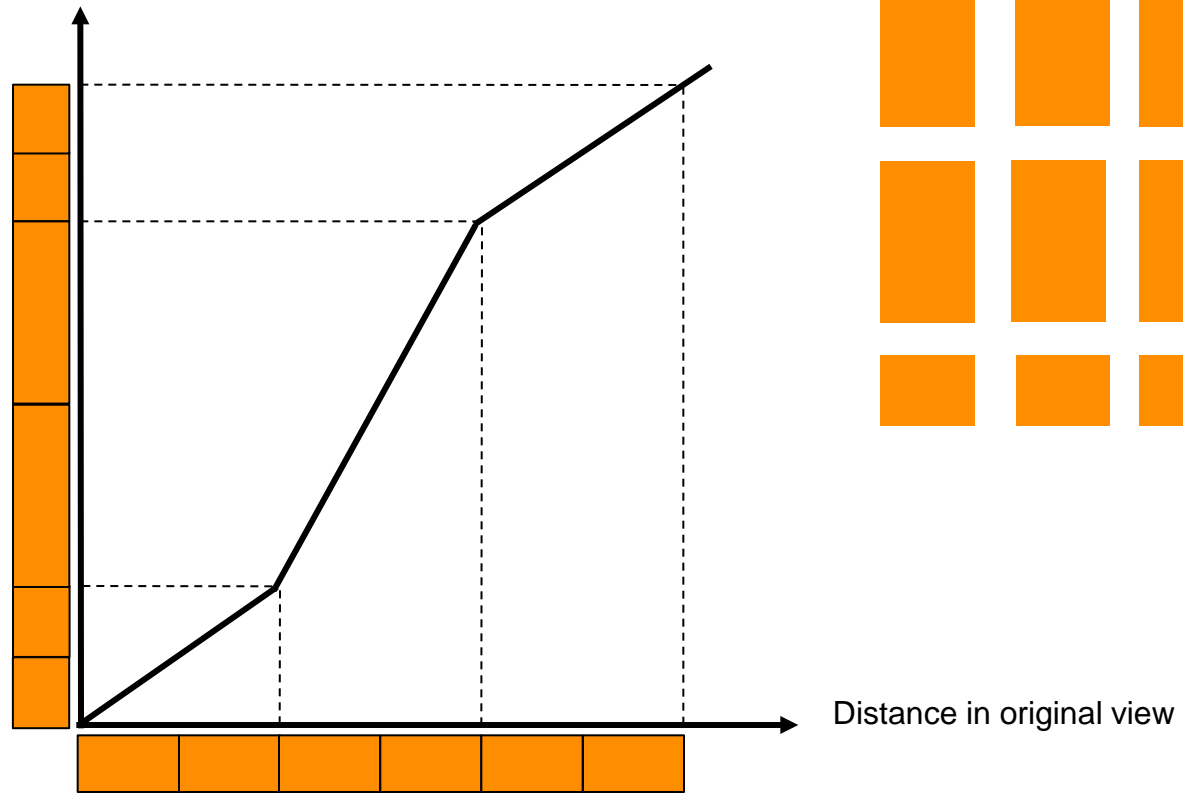
- Show a huge amount of information with limited amount of space
- Focus plus context: provide context to support navigation tasks
- No zooming and no scrolling required

Distortion



Distortion

Distance in distorted view

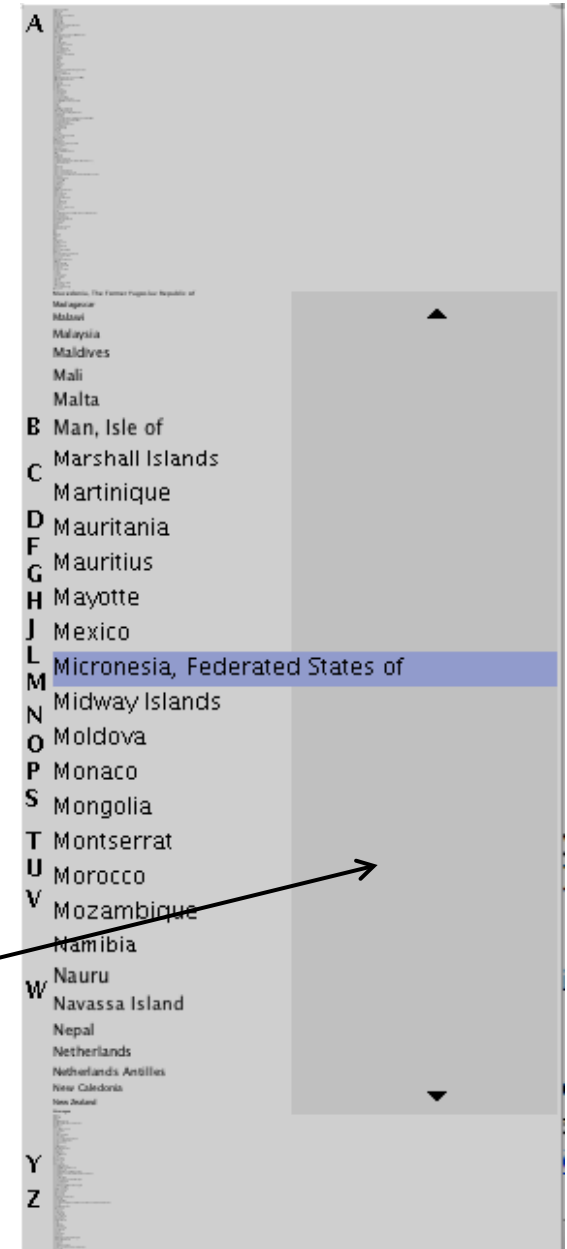


Example: Transfer function for a bifocal display

Fisheye Menu

- Example: Fisheye Menu by Bederson et al. [1]
- Font-size reduced with distance from the cursor
- [Demo](#)

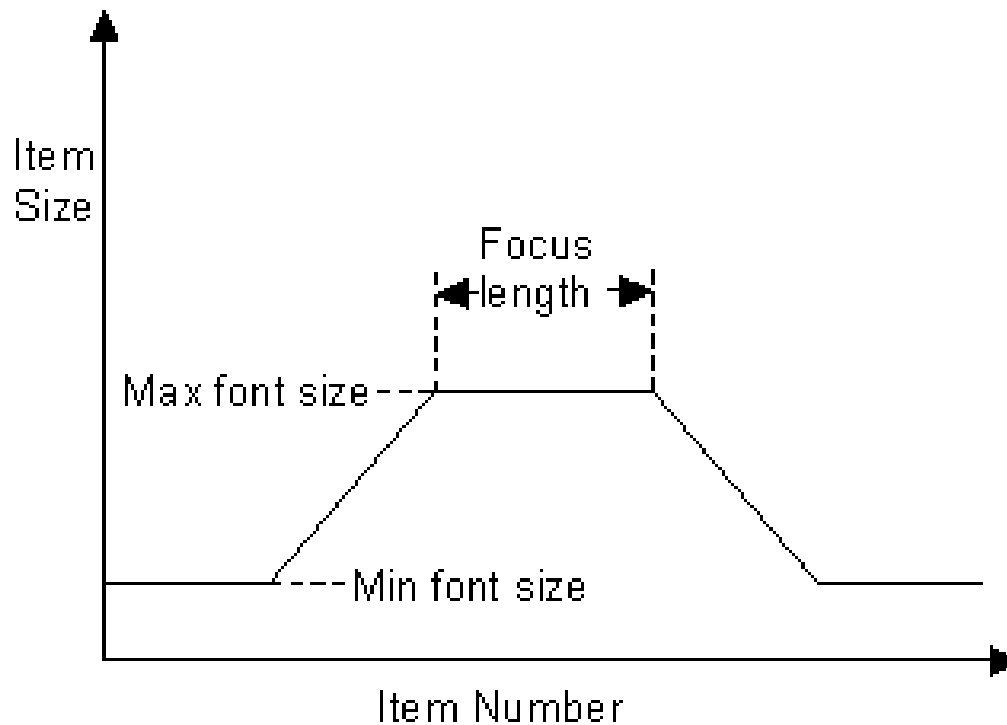
Fixation area to solve the overshoot problem



Fisheye Menu [1]

Fisheye Menu

- Degree of interest function



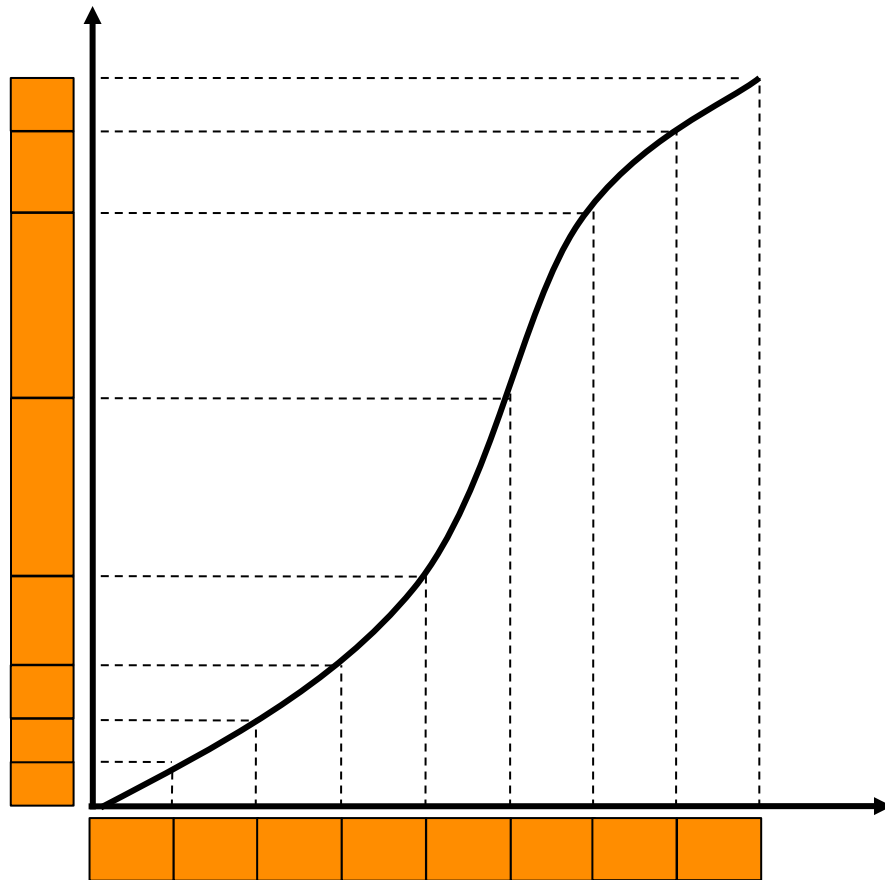
[1]



Fisheye Menu [1]

Fisheye Menu

- Transfer function for the fisheye menu [1]



Fisheye Menu [1]

Magnifying Glass

I am just an example. Do not read me since that would be a waste of your precious time. If you already did read me ... too bad for you.

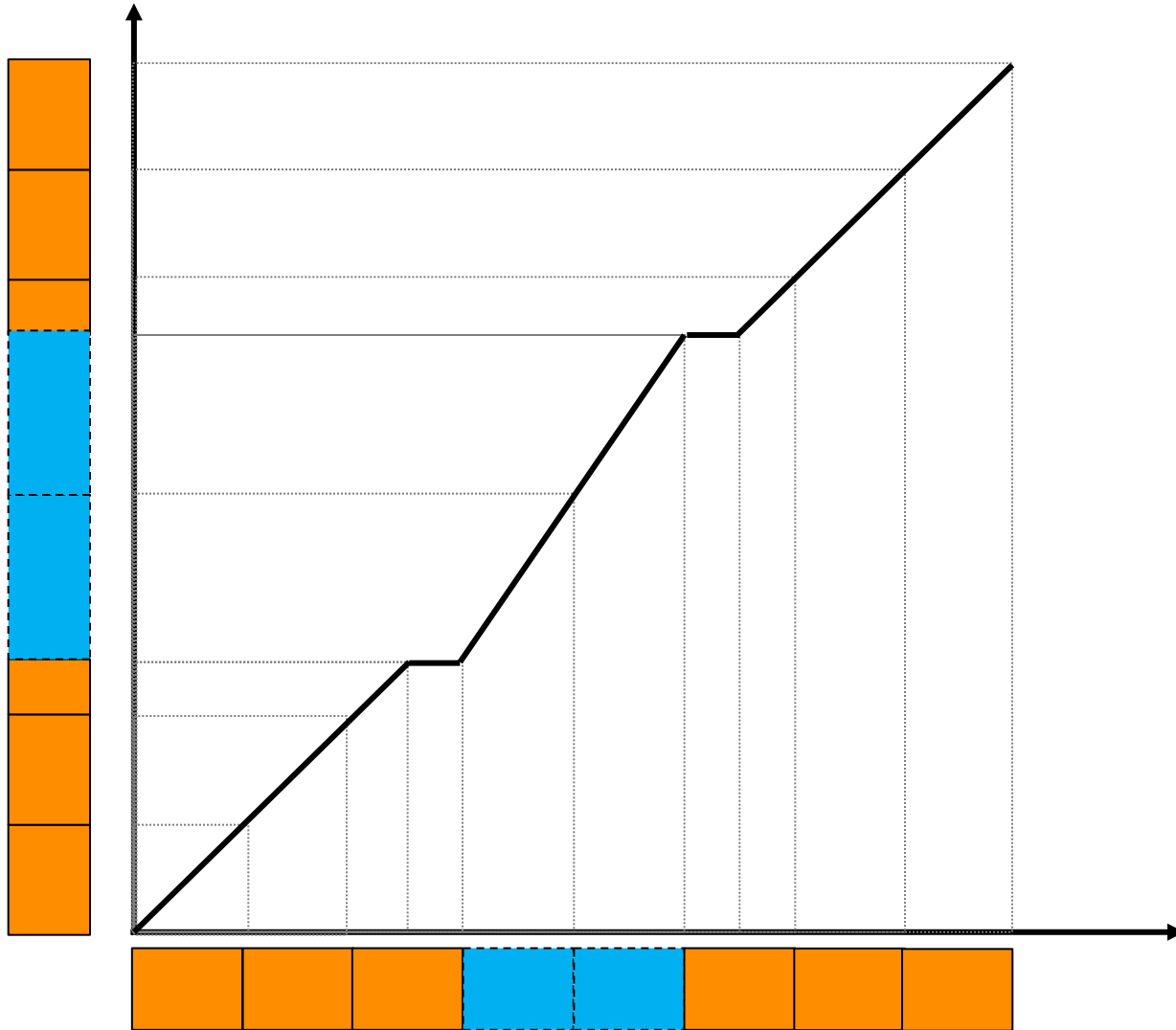
I am just an example. Do not read me since that would be a waste of your precious time. If you already did read me ... too bad for you.



- Magnifying glass is not a focus plus context technique
- Why not?

Context close to the detail gets completely lost!

Magnifying Glass



Klausur

Termin: 05.02.2015, 16:00-18:00 Uhr

Frist zur Anmeldung: 01.02.2015, 23:59 Uhr

Frist zur Abmeldung: 03.02.2015, 23:59 Uhr

Ort: Schellingstr. 3/4, Raum H 030, Raum S 001

Wichtig:

- Closed book Klausur: Wörterbuch ist erlaubt. Alle anderen Materialien (Bücher, Skript, Mitschriften, etc.) sind verboten.
- Mobiltelefone, Computer und alle anderen Kommunikationstechnologien sind strengstens verboten. Am besten gleich daheim lassen.
- Taschenrechner mitnehmen
- Lineal mitnehmen
- Studentenausweis mitnehmen
- Echten (!!) Lichtbildausweis mitnehmen (z.B. Personalausweis oder Reisepass)

References

1. Stephen G. Eick, Joseph L. Steffen, and Eric E. Sumner Jr. *SeeSoft - A tool for visualizing line oriented software statistics*. IEEE Transactions on Software Engineering, 18(11):957--968, November 1992.
2. Perlin, K. and D. Fox. Pad: An Alternative Approach to the Computer Interface. Computer Graphics (Proc. SIGGRAPH' 93), 57-72.
3. Alex Olwal, Steven Feiner, and Susanna Heyman. 2008. Rubbing and tapping for precise and rapid selection on touch-screen displays. In *Proceedings of the twenty-sixth annual SIGCHI conference on Human factors in computing systems* (CHI '08).
4. BEDERSON, Benjamin B. The promise of zoomable user interfaces. *Behaviour & Information Technology*, 2011, 30. Jg., Nr. 6, S. 853-866.
5. Gary Anthes. 2012. Zoom in, zoom out. *Commun. ACM* 55, 12 (December 2012), 18-19.
6. Robert L. Walter, Sergey Berezin, and Ankur Teredesai. 2013. ChronoZoom: travel through time for education, exploration, and information technology research. In *Proceedings of the 2nd annual conference on Research in information technology* (RIIT '13). ACM, New York, NY, USA, 31-36