Smart graphics: Overview of lecture content, rules & conditions

Lecture „Smart Graphics”

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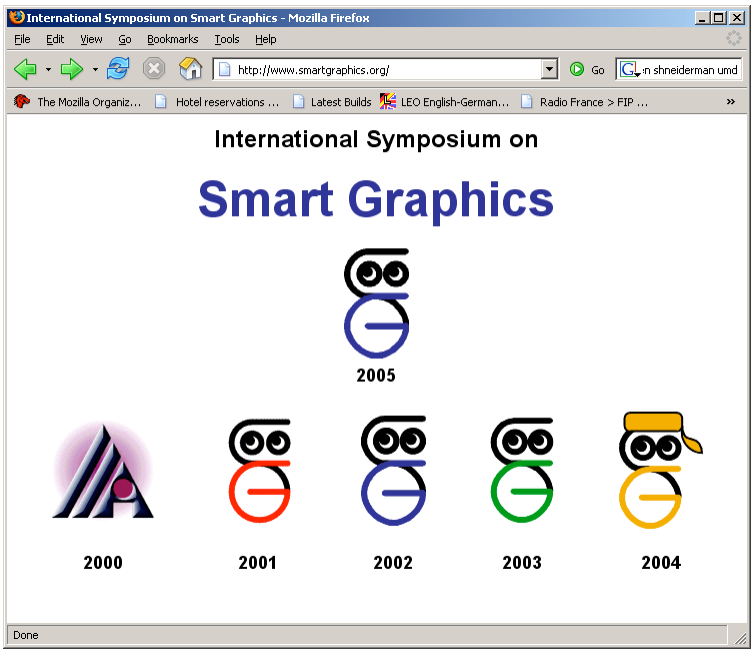
Topics Today

- The term “Smart Graphics”
- Topics of the lecture
- Exercises
- Conditions for getting the certificate
- Useful resources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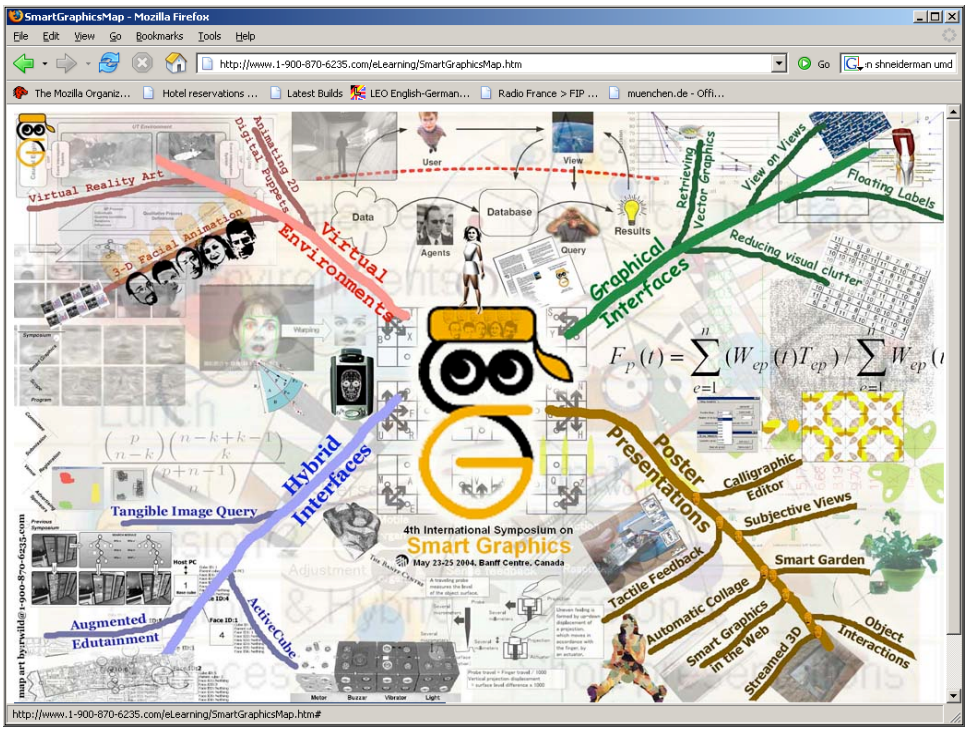
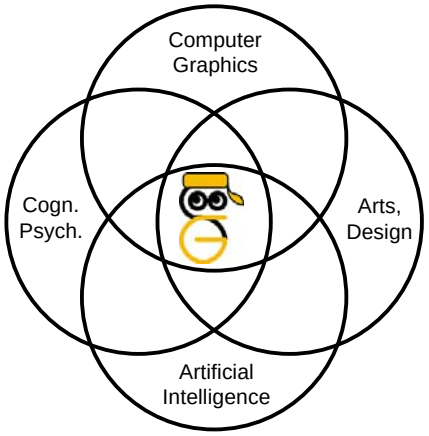


Goal: 4 disciplines talking to each other



- Designers have produced graphics forever
- Psychologists tell us how humans perceive and process
- AI provides the tools to use this knowledge
- Computer Graphics provides the medium

Examples of Smart Graphics

Mapmaker

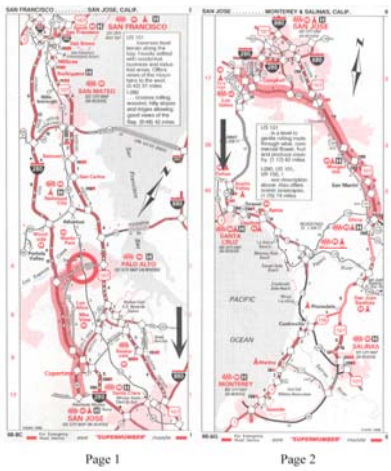
(Agrawalla & Stolte, SG 2000)

- Ziel ist die automatische Generierung von Wegskizzen
- Berücksichtigung von Designregeln
- Gute Verständlichkeit und Handhabbarkeit

Motivation

- Statisches Kartenmaterial

(a)



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(b)

Motivation

- Schlechtes dynamisches Kartenmaterial

(a)

(b)

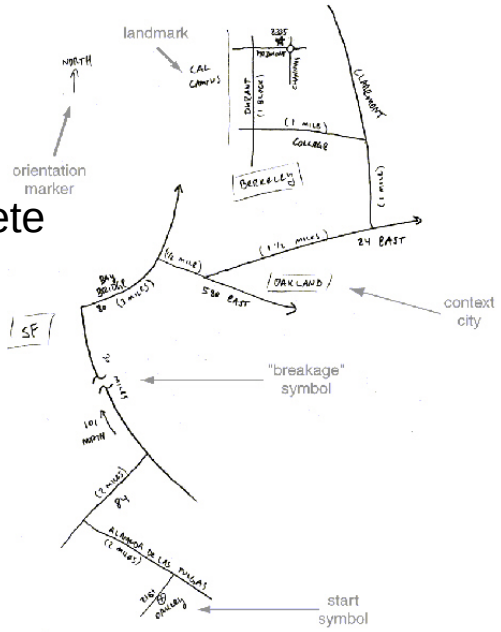
MapBlast

Vorbild

- Handgezeichnete Wegskizzen

Vorteile:

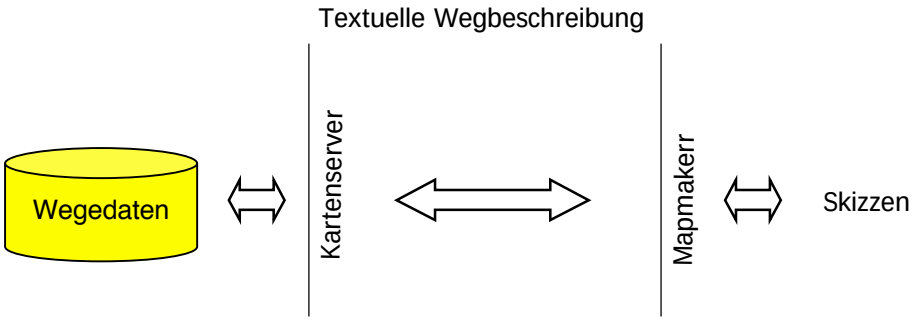
- Auswahl der Details
- Intelligente Skalierung



Designkriterien für Karten

- Lesbarkeit
- Prägnanz
- Vollständigkeit
- Verfügbarkeit

Skizzengenerierung

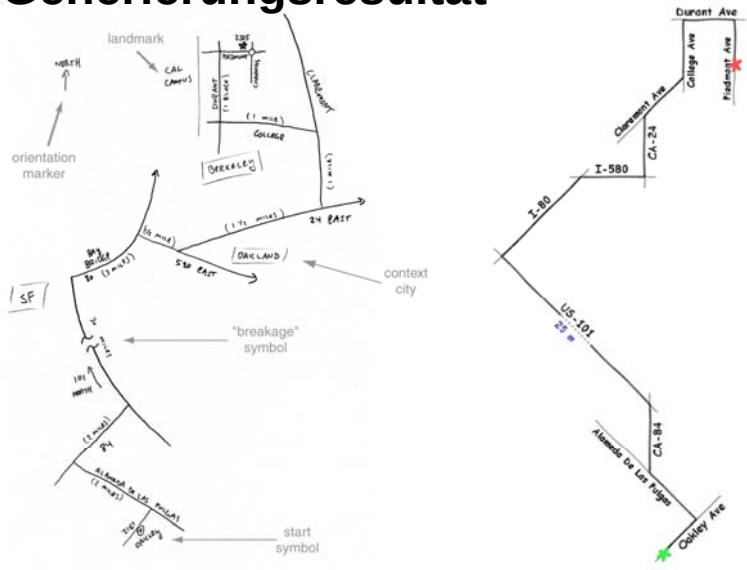


Generierungsschritte

- Plazierung der Wegstrecken
- Plazierung von Bezeichnern
- Hinzufügen von Hilfselementen
- Realisieren des „handgezeichneten“ Stils der Wegskizze

- Kriterium:
  - Längenverhältnisse müssen erhalten bleiben

Generierungsresultat



(a) Hand-Drawn Map (b) System Generated Map

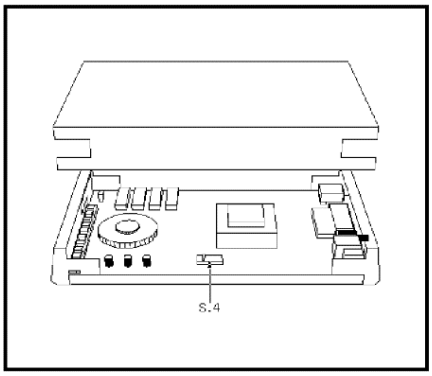
Planbasierter Graphikdesigner

(André & Rist 1995)

- Generiert funktionelle Graphiken ausgehend von einem Präsentationsziel
- Benutzt allgemeine Designregeln und Wissen über die Domäne
- Realisiert Graphiken mithilfe gängiger Illustrationstechniken

Beispiel aus WIP

Set the code switch S.4 to R in order to set for reception. Connect the plug of the telephone. Press the on/off switch in order to turn on the modem. The LED L.11 lights up after turning on the modem.



About the lecture & exercises

3 main parts of the lecture

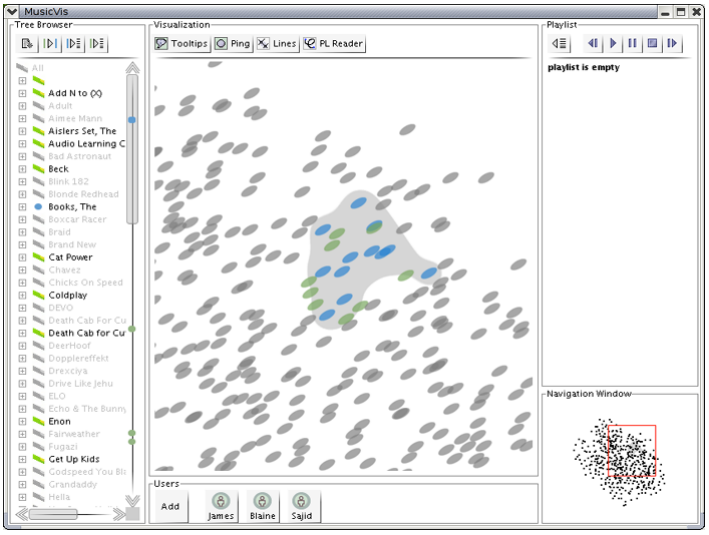
- Motivations
  - Graphics & psychology
  - Graphics & arts & design
  - Graphics & communication
- Methods
  - A collection of AI tools and formalisms
  - How they can be applied to graphics
- Milestones
  - Examples from various fields

Exercises

- A few warm-ups in the beginning
  - Mainly about perception
- One major class project (in infoviz)
  - Base concept, criteria
  - Choice of tools
  - Implementation of a working demo
  - Documentation in the form of a research paper
- Groups of 2-4 students
- Final presentation at the end of the semester
  - Short talk explaining what and how
  - Demo of the implementation
  - Will be open to the public

Example student project: MusicVis

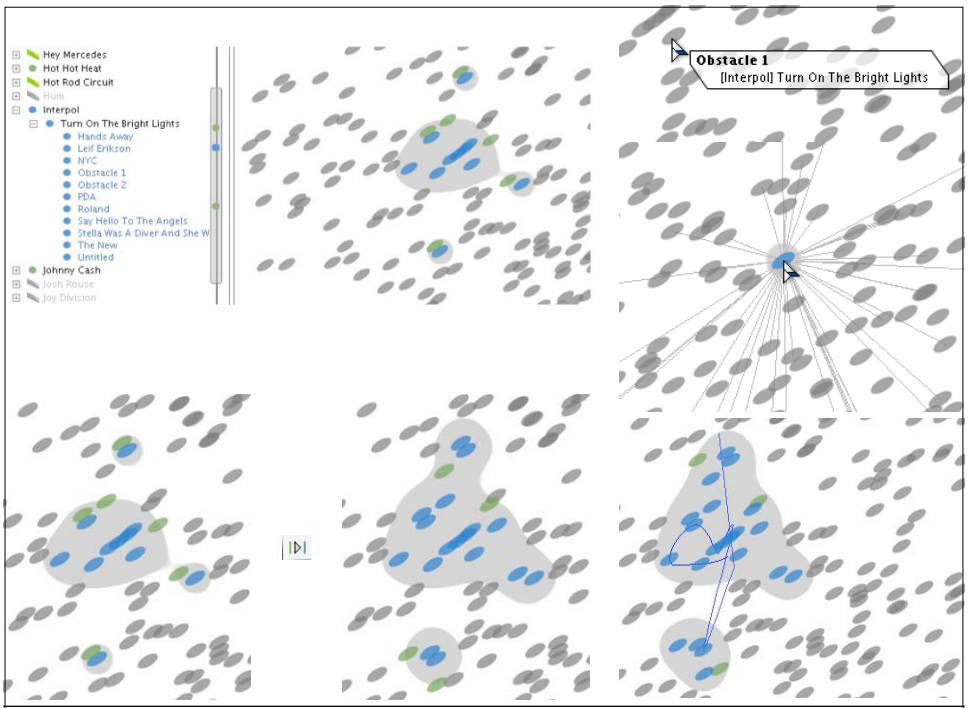
(Blaine Boman, James Pak, Sajid Sadi, Columbia University)



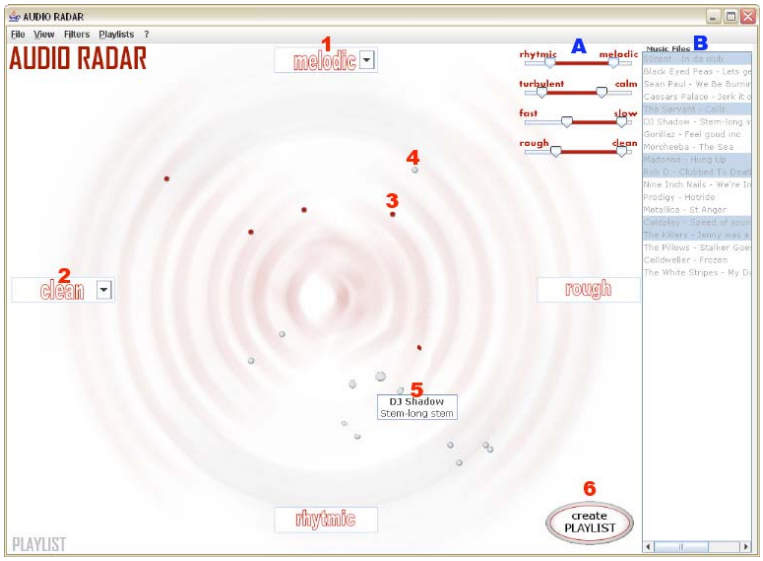
MusicVis (cont'd)

- Visualization of MP3s in a starfield and a tree (coordinated displays)
- Mouse interaction with this visualization
- System learns which songs..
  - have been played closely together
  - are in the same playlist
- Formalism: Markov Model
  - Prediction of next song based on history

- http://www1.cs.columbia.edu/~paley/spring03/assignments/HWFINAL/bgb10/



LMU Example (2005): Audio Radar



Some useful links

- http://www.smartgraphics.org/
- http://www.cogsys.wiai.uni-bamberg.de/teaching/overview.html
- http://www1.cs.columbia.edu/~paley/spring03/
- http://www.cs.umd.edu/class/spring2005/cmsc838s

- Exercises:
- https://wiki.medien.ifi.lmu.de/view/Main/UebungSmartGraphicsWS0506

- Mailing list:
- https://tools.rz.ifi.lmu.de/mailman/listinfo/sg0506