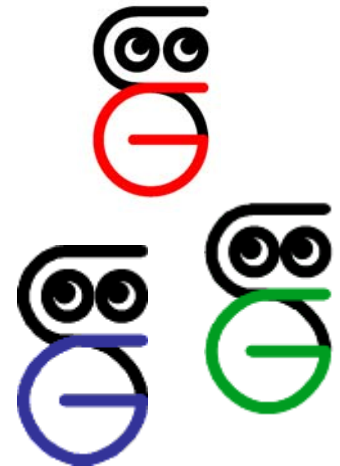


# Smart graphics: Overview of lecture content, rules & conditions

Lecture „Smart Graphics”  
Andreas Butz, Otmar Hilliges  
19.10.2005



# Topics Today

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

International Symposium on Smart Graphics - Mozilla Firefox

File Edit View Go Bookmarks Tools Help

http://www.smartgraphics.org/ Go

The Mozilla Organiz... Hotel reservations ... Latest Builds LEO English-German... Radio France > FIP ...

# International Symposium on Smart Graphics

The image shows the evolution of the Smart Graphics logo over time. At the top center is the 2005 logo, a stylized owl with a blue body and black eyes. Below it are five smaller logos for the years 2000, 2001, 2002, 2003, and 2004. The 2000 logo is a stylized 'A' with a pink circle. The 2001 logo is a stylized owl with a red body. The 2002 logo is a stylized owl with a blue body. The 2003 logo is a stylized owl with a green body. The 2004 logo is a stylized owl with a yellow body and a yellow hat.

2005

2000 2001 2002 2003 2004

Done

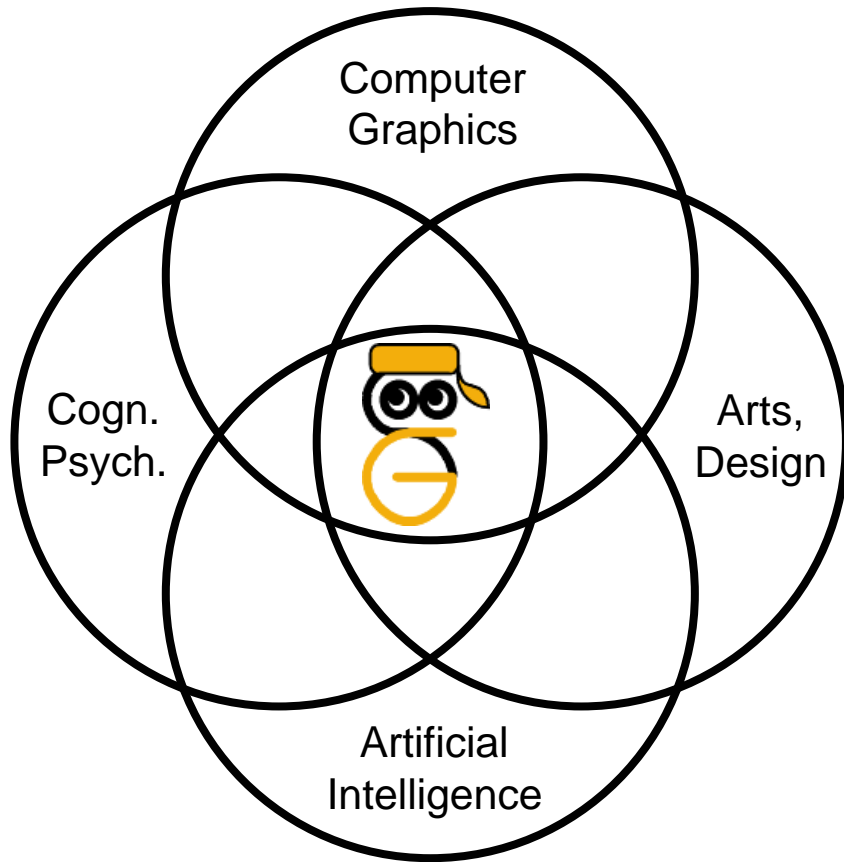


**Virtual Reality Art**  
**3-D Facial Animation**  
**Virtual Environments**  
**Hybrid Interfaces**  
**ActiveCube**  
**Augmented Edutainment**  
**Tangible Image Query**  
**Adjustment**  
**4th International Symposium on Smart Graphics**  
 May 23-25 2004, Banff Centre, Canada  
**Graphical Interfaces**  
**Retrieving Vector Graphics**  
**View on Views**  
**Floating Labels**  
**Reducing visual clutter**  

$$F_p(t) = \frac{\sum_{e=1}^n (W_{ep}(t)T_{ep})}{\sum_{e=1}^n W_{ep}(t)}$$
  
**Poster Presentations**  
**Calligraphic Editor**  
**Subjective Views**  
**Smart Garden**  
**Tactile Feedback**  
**Automatic Collage**  
**Smart Graphics in the Web**  
**Streamed 3D**  
**Object Interactions**

**User** → **View** → **Results**  
**Data** → **Database** → **Query** → **Results**  
**Agents** → **Database** → **Query** → **Results**  
**Warping**  
**Motor** **Buzzer** **Vibrator** **Light**  
**Prize travel = Finger travel / 1000**  
**Vertical projection displacement = 1000**  
**Surface level difference = 1000**

# 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

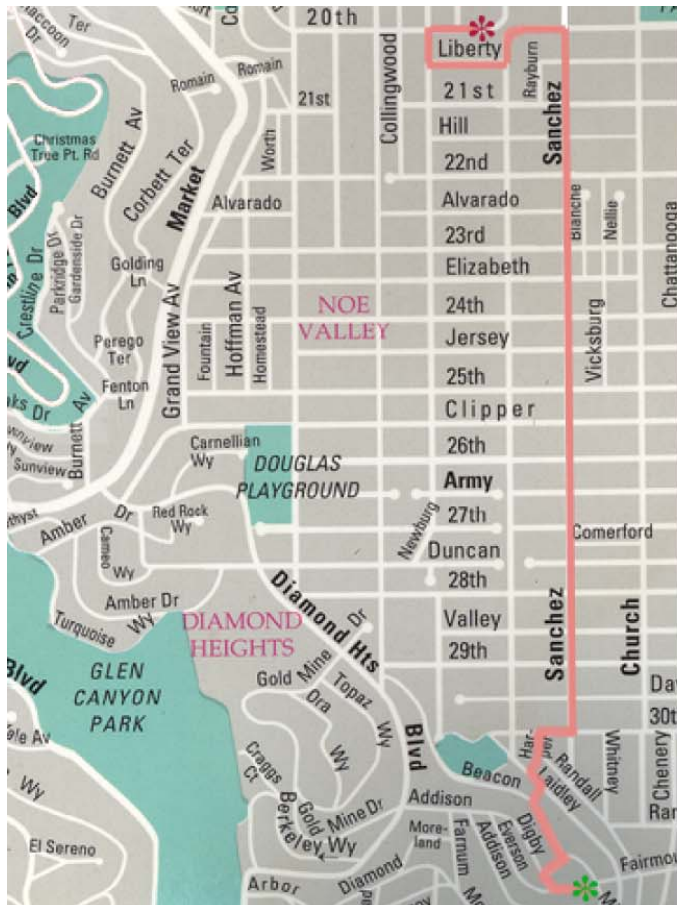
(Agrawalla & Stolte, SG 2000)

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

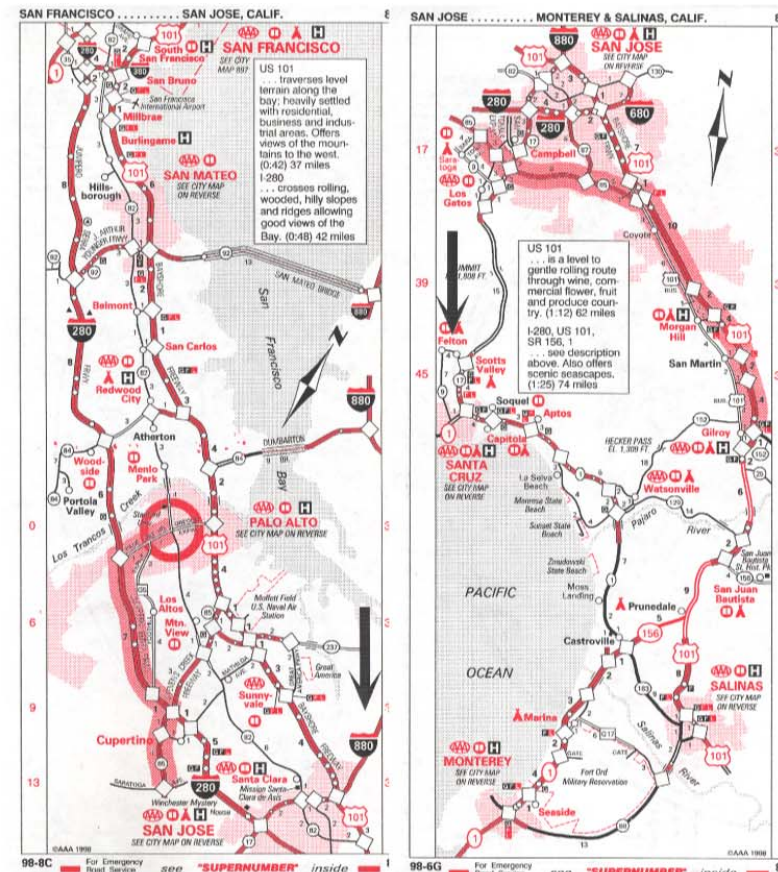


# Motivation

- Statisches Kartenmaterial



(a)



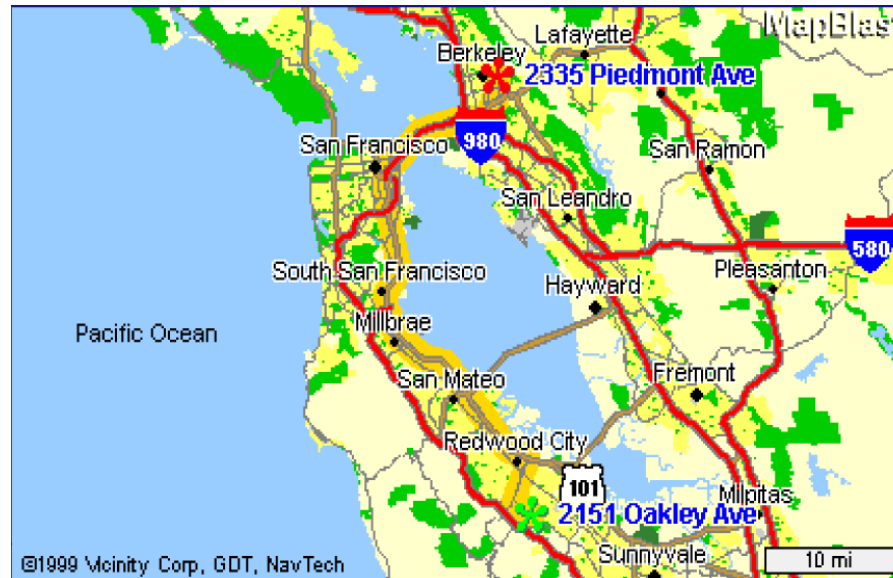
Page 1

Page 2

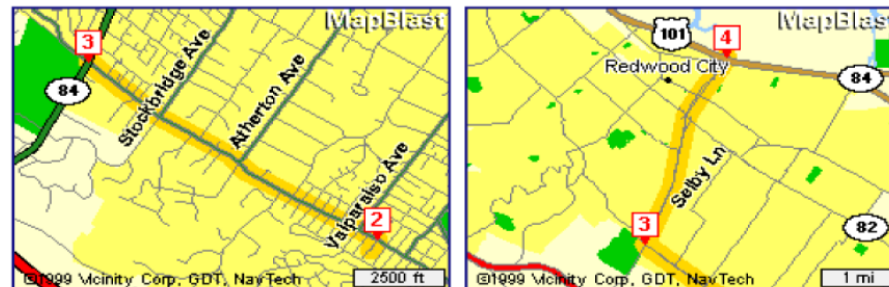
(b)

# Motivation

- Schlechtes dynamisches Kartenmaterial



(a)



(b)

MapBlast

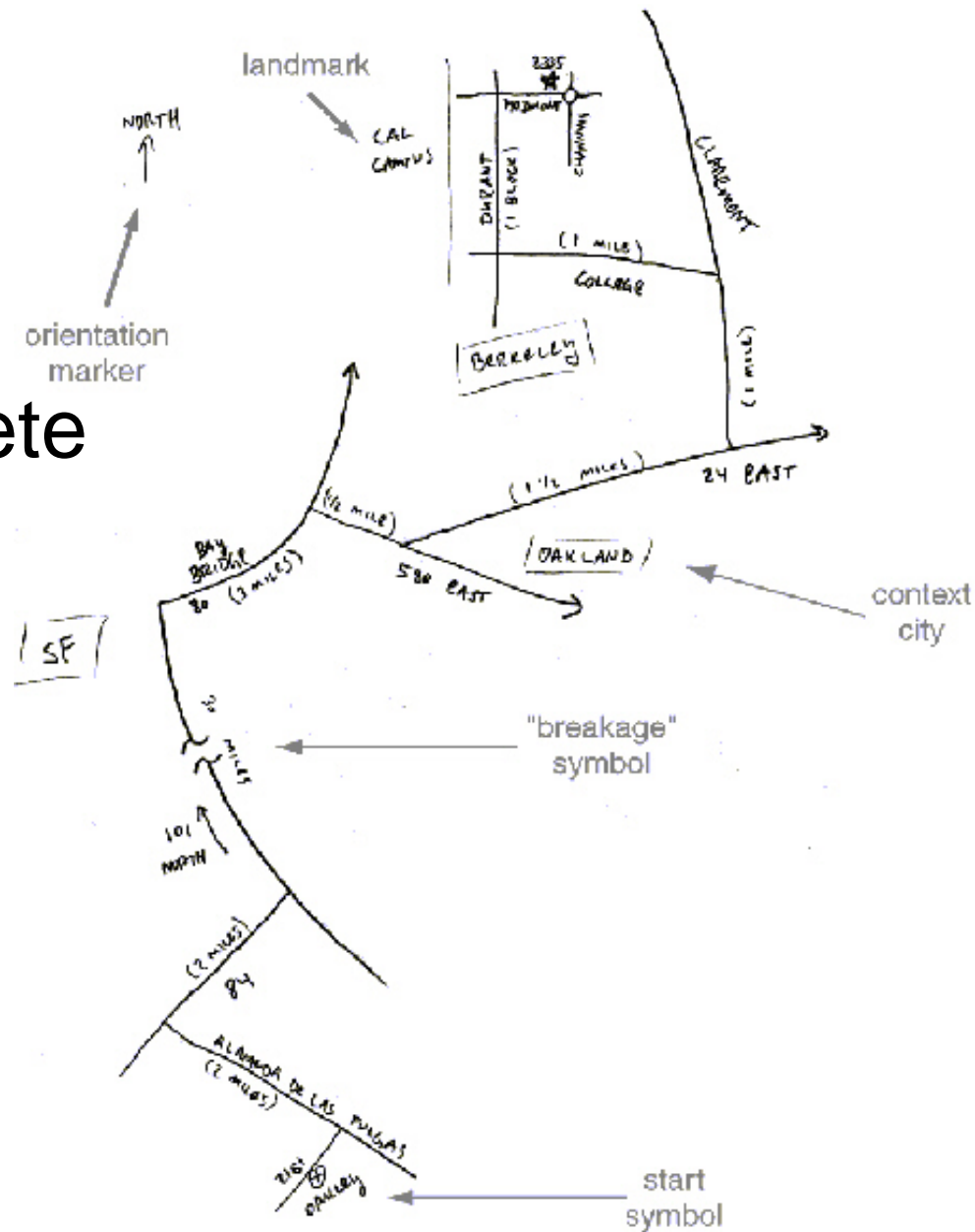


# Vorbild

- Handgezeichnete Wegskizzen

Vorteile:

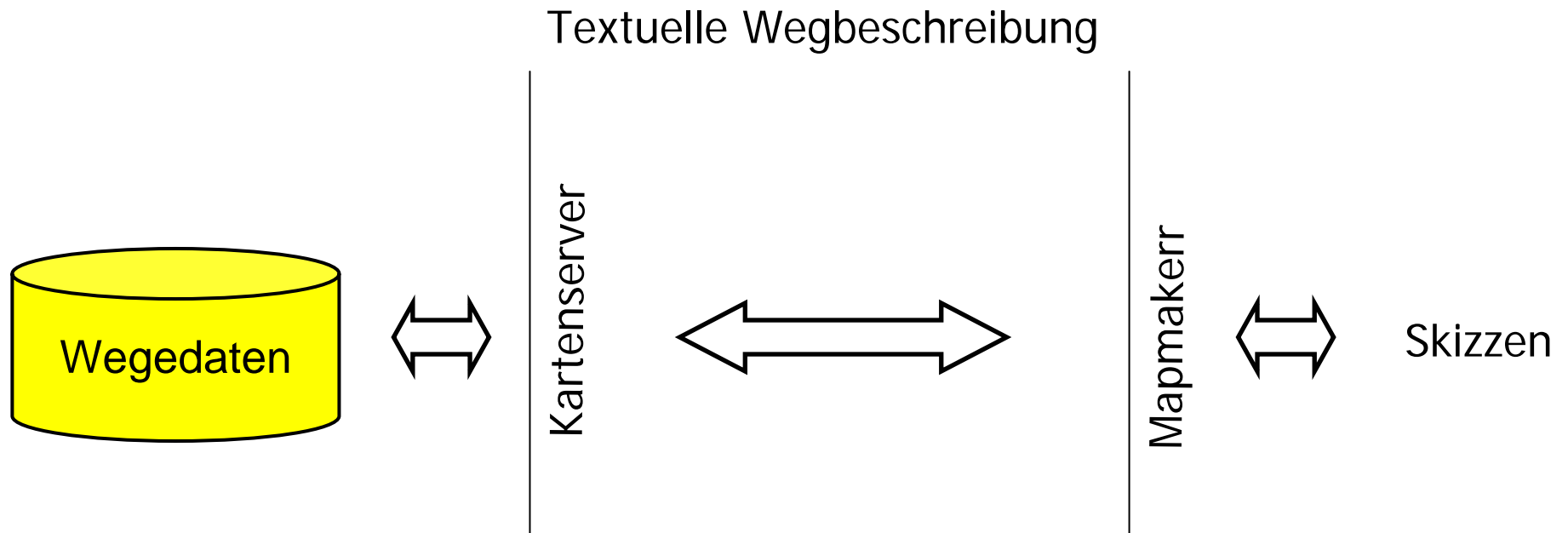
- Auswahl der Details
- Intelligente Skalierung



# Designkriterien für Karten

- Lesbarkeit
- Prägnanz
- Vollständigkeit
- Verfügbarkeit

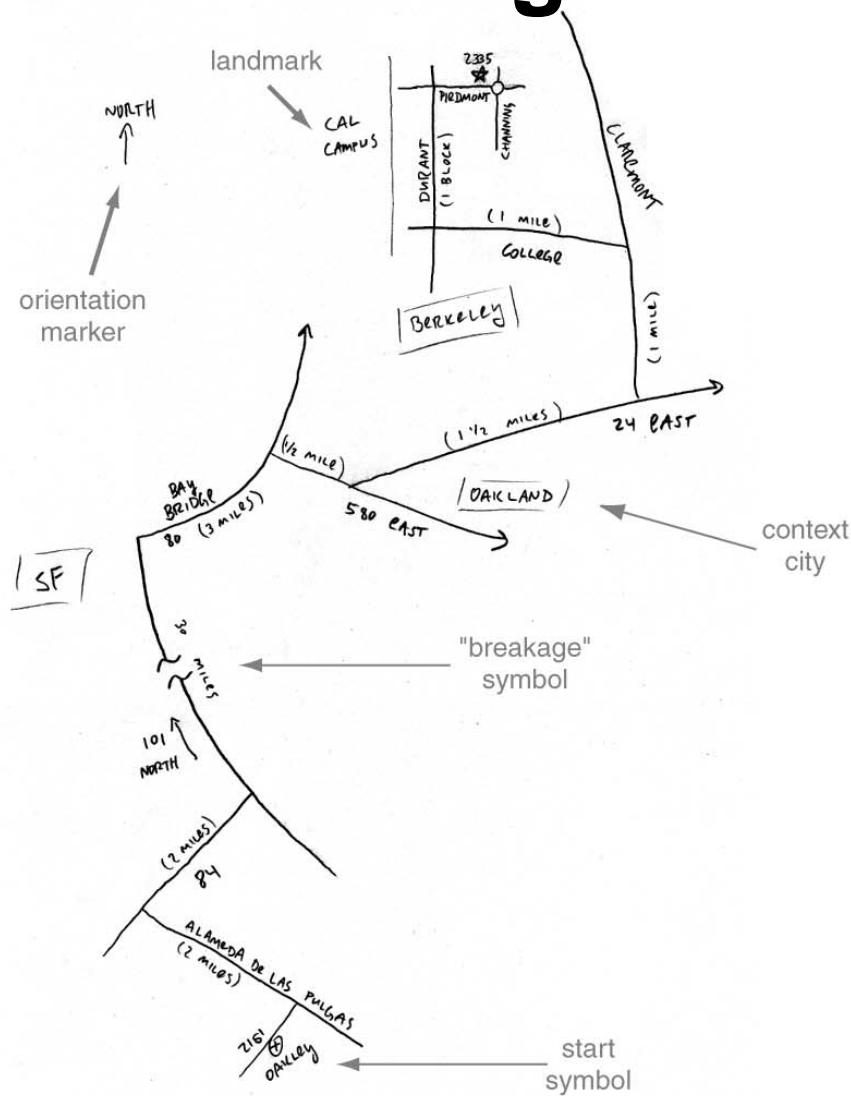
# Skizzengenerierung



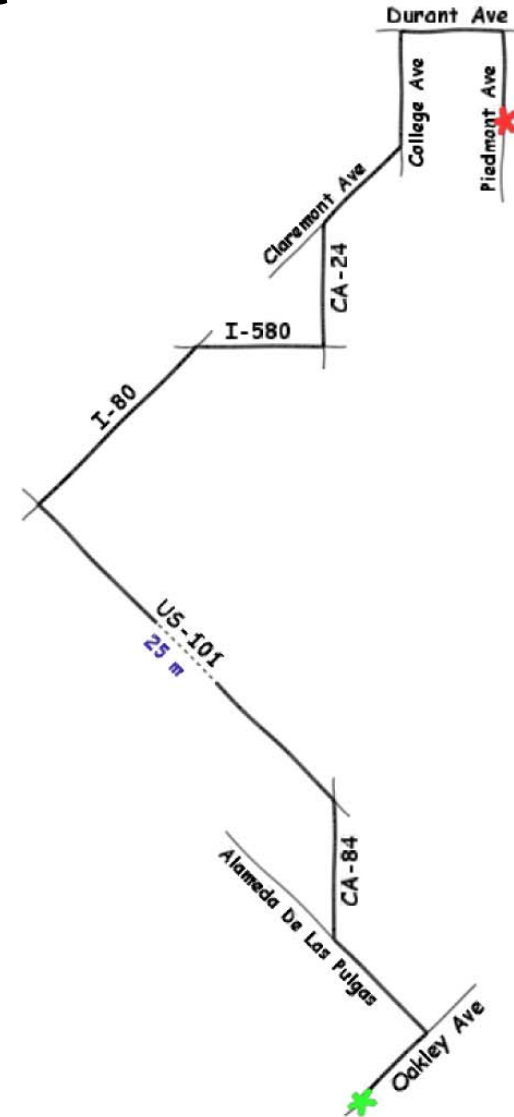
# Generierungsschritte

- Platzierung der Wegstrecken
- Platzierung von Bezeichnern
- Hinzufügen von Hilfselementen
- Realisieren des „handgezeichneten“ Stils der Wegskizze
  
- Kriterium:
  - Längenverhältnisse müssen erhalten bleiben

# Generierungsergebnis



(a) Hand-Drawn Map



(b) System Generated Map

# Planbasierter Graphikdesigner

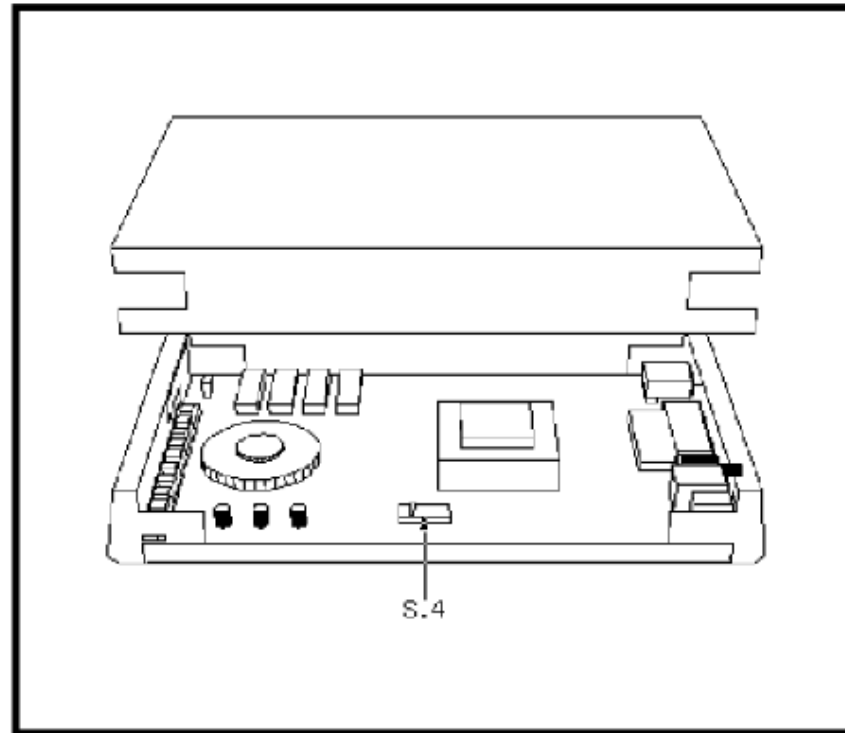
(André & Rist 1995)

- 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

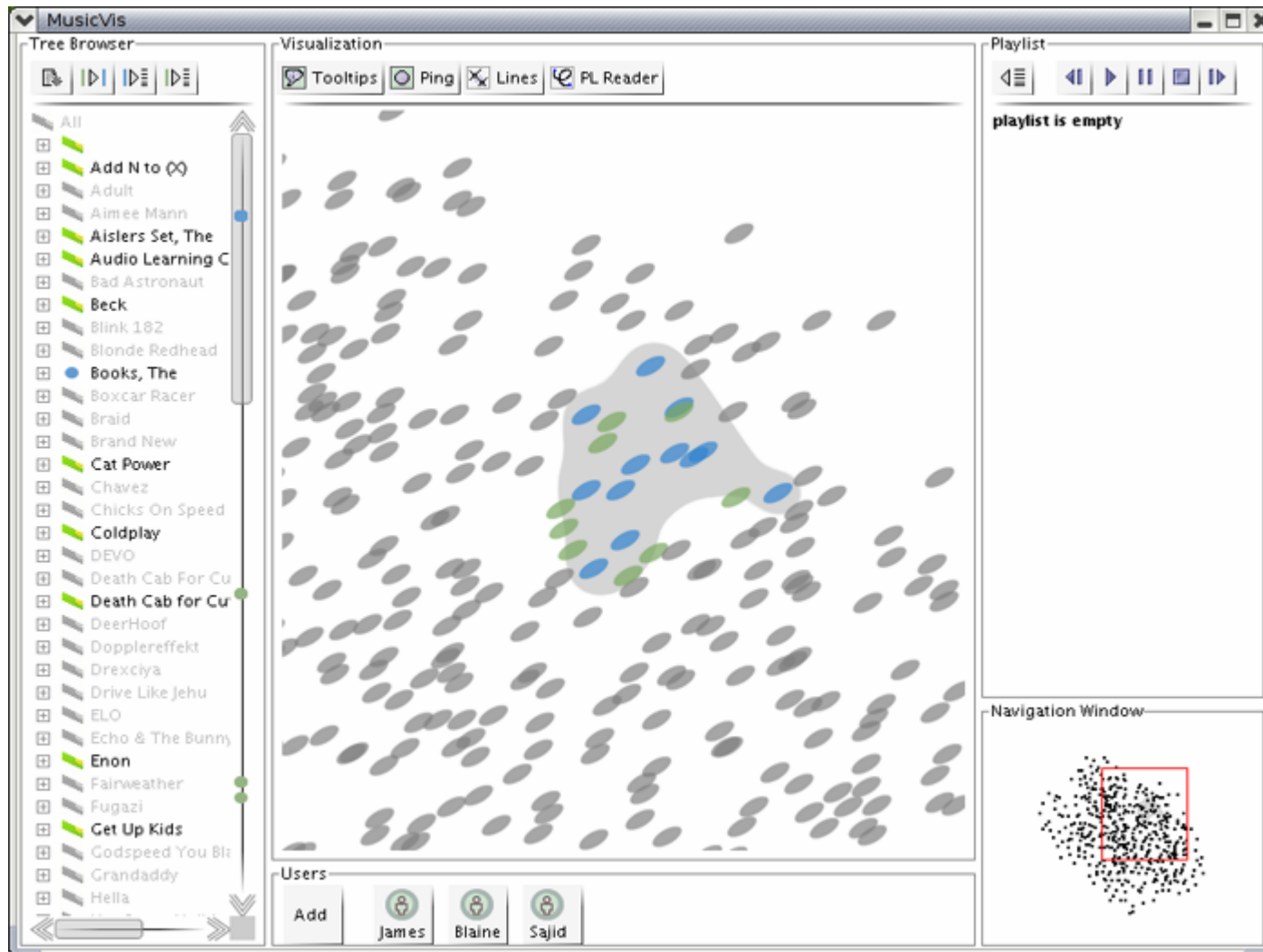
- Motivations
  - Graphics & psychology
  - Graphics & arts & design
  - Graphics & communication
- Methods
  - A collection of AI tools and formalisms
  - How they can be applied to graphics
- Milestones
  - Examples from various fields

# 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

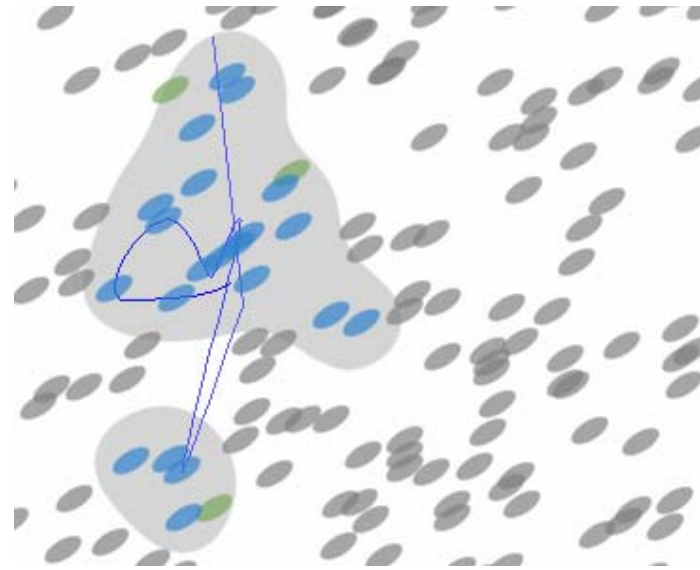
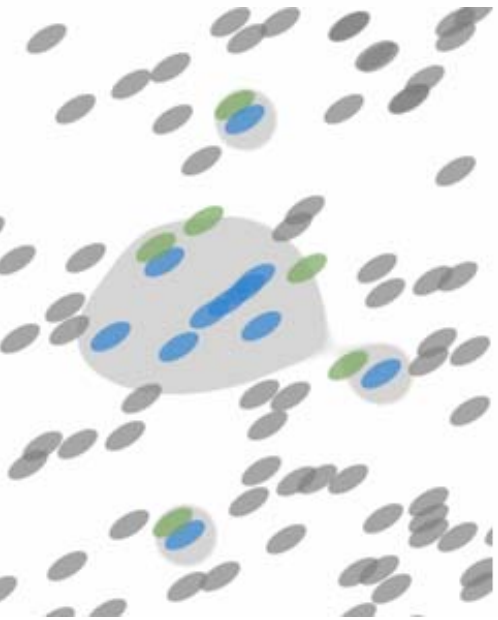
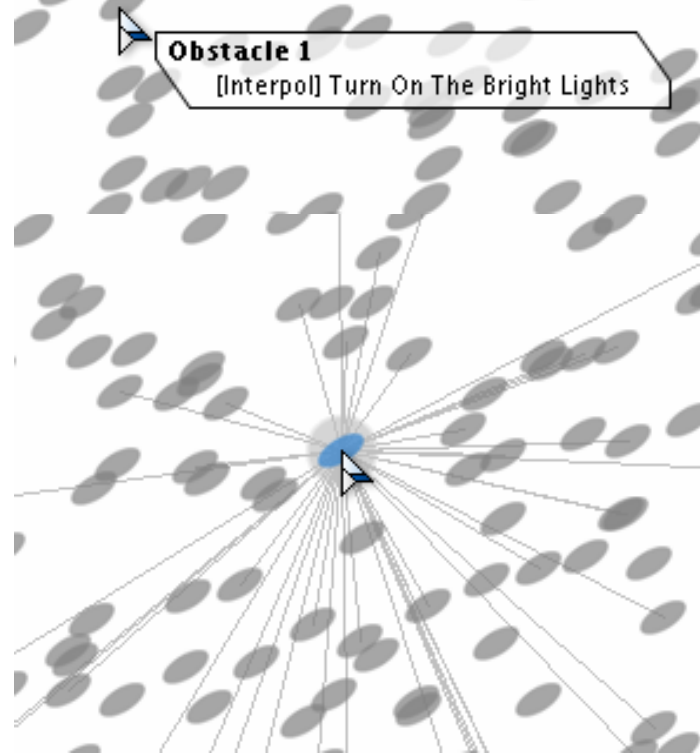
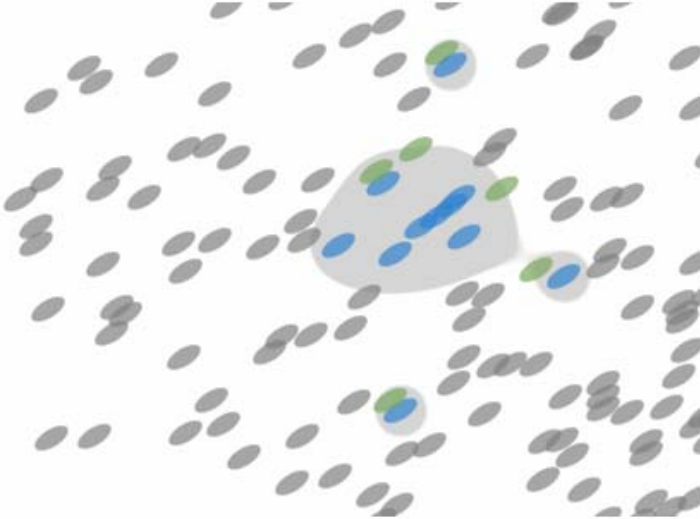
(Blaine Boman, James Pak, Sajid Sadi, Columbia University)



# 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/>

- Hey Mercedes
- Hot Hot Heat
- Hot Rod Circuit
- Hum
- Interpol
- Turn On The Bright Lights
  - Hands Away
  - Leif Erikson
  - NYC
  - Obstacle 1
  - Obstacle 2
  - PDA
  - Roland
  - Say Hello To The Angels
  - Stella Was A Diver And She W
  - The New
  - Untitled
- Johnny Cash
- Josh Rouse
- Joy Division



# 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>