Computer Graphics for the Media Industry (CGMI)

A new MSc program

Directing of Virtual Museum

- Cameron-Kenderdine… Chapter 18, 261-279
- Engaged Dialogism in Virtual Space…

-

City = process in time & space

- **CORP 2002 paper by Bettina Kohler, Peter Ferschin et al. from IEMAR TU Wien team:**

- **The City as a Process in Time and Space**

- **Next slide shows this at the first glance**

Urban Process in Time & Space

- Real world photo by A. F., Graz 2001

General Problem – Time Visualization

- **Bakhtinian Understanding to Web Graphics**

- **Selected Risky Information Visualization Ideas**

Digital Storytelling

- **2000-- Drama – Aristotle, conflict**
- **1929 Fairy tales – Vladimir Propp, 30+ situations**
- **e.g. Umberto Eco on James 007 Bond stories**
- **...**
- **2000++ Yann Martel – The Life of Pi - "the ultimate art of storytelling"**
- **Semiotics, VR is a semiotic system**

- **QVORTRUP, L. ed. 2001/2. *Virtual Interaction/Space***

Genius Loci

- **Genius Loci = Spirit of the Place, LokalGeist?**
- **Etruscans – mundus, urbs, Roma**
- **Genius Loci ... Phenomenology**
- **NORBERG-SCHULZ, CH. 2000. *Genius Loci*.**
- **Implications (Hegel, Marx, Heidegger)**
- **Bogdan Bogdanovic in Vienna**

Virgin Tower Movie – P. Gejgus

•

# V. Tower Modeling by K. Darilkova

Virgin Tower Story

- **Prohibited love sujet (Romeo&Juliet type)**
- **She, He...**
- **... and the bad guy from Kärnten**
- **(her uncle, and a bishop, very keen to control her future heritage)**
- **He is the owner of Devin castle, wedding**
- **Sad story, no happyend: 2 graves**
- **"The most beautiful Bratislava legend"**

Virgin Tower Story – Jaro Baran
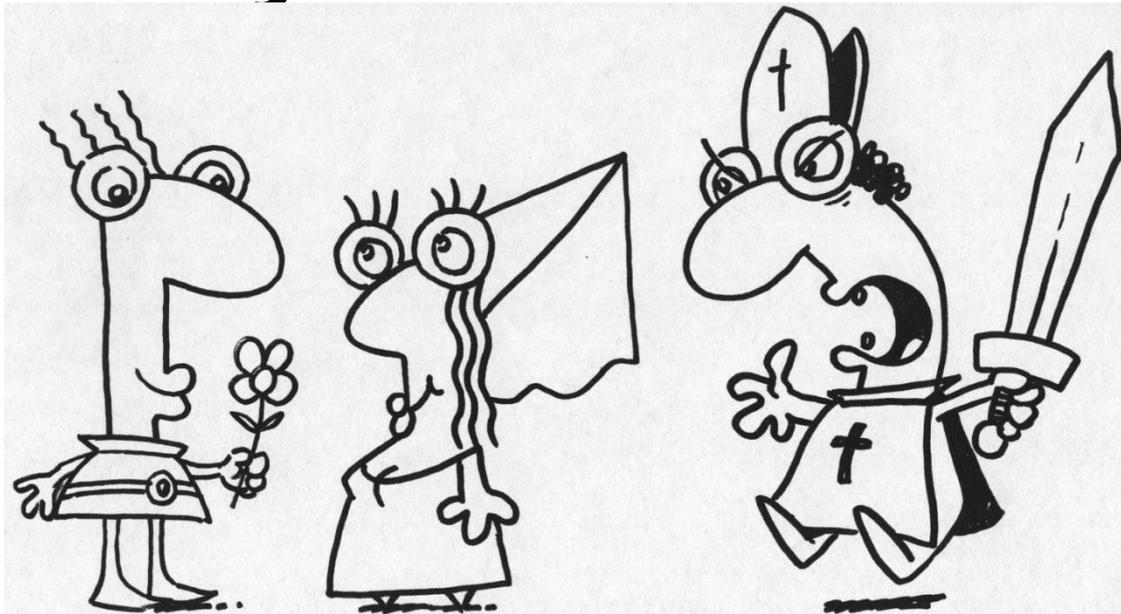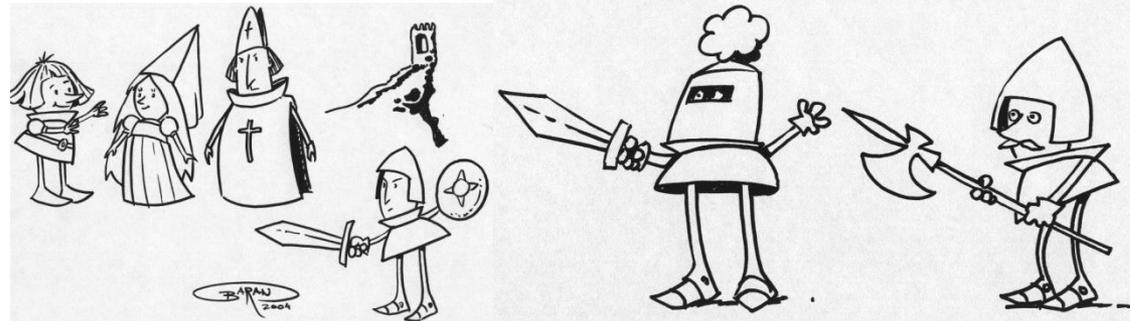
Directing and Storytelling

This core module will enable students to write, design, storyboard and direct an animated feature. The module will comprise of six main elements:

- Drawing
- Narrative
- Technical feasibility assessment
- Storyboarding
- Presentation
- Directing

Drama and Acting

This optional module will provide the students with an introduction to the processes of creating and representing characters. This module will include:

- Methods of reading rhythm, shape, energy and text in relation to human and animal bodies and movements
- Placing these methods in the context of live performance, moving image and animation in order to explore how embodied characters become represented
- Using the practical study of masks, live object animation and animated figures to examine ways in which meanings are created and received
- Undertaking critical analysis of screen based characterization in film, animation and computer games to explore how a character is represented and read.

Directing

- "Directing cannot be taught"
- O. Zahradnik (2009): The goal of directing is to transfer the deepest message of given text (script) from given author to given audience
- How to measure the quality of directing?
- Informal measure = success ~ number of copies
- Nobel Prize, Academy Awards, Webby Awards, Golden Globe, CPL for online games…
- How to teach/learn directing?
-

Directing Workflow

- Idea!
- Message
- Name, logo, pitch, treatment/synopsis, script
- Preproduction
- Production ~ shooting, stock footage, sound space
- Postproduction
- Promotion, distribution, remake/forget

Directing Dimensionality

- Dimension => channel mode
- 1D space L => text string, quipu, Morse …---… 112
- 1D time T => speech, music, sound, …---…
- 2D space static => drawing, painting, photo
- 2D space dynamic T => film/movie, TV
- 3D space static => sculpture, architecture, garden
- 3D space dynamic T => theatre, stereomovie
- 3D space dynamic T interactive => games, e-learning, virtual museum
- VM includes all directings!!!

Directing Theories (No. 1 and Example and ...)

- 1D space L => Poetics by Aristotle .. McKee, Field
- 1D time T => Rhetoric by Aristotle, music theories
- 2D space static => visual art theories
- 2D space dynamic T => Ejzenstein etc.
- 3D space static => Vitruv, vis-art theories, Schulze
- 3D space dynamic T => Aristotle .. Scherhaufer
- 3D space dynamic T interactive => VE: Qvortrup, VM: Cameron-Kenderdine … Appraisal theory gives MEASURE: virtual museum -> real number

Directing of Virtual Museum

- Cameron-Kenderdine… Chapter 18, 261-279
- Engaged Dialogism in Virtual Space…

- Best ones: Virtual Museum of Canada,
- September 11: Bearing Witness to History
- Double theoretical framework: Rhetoric&Appraisal

- Appraisal theory gives MEASURE:
- virtual museum -> real number ~ engagement

Rhetoric

- Part of trivium (in old Greek high school) = rhetorike techne, grammar, dialectics
- 1D time T => narrattion… radio play
- Goal – to persuade audience (enthymeme)
- Greatest rhetors – Demostenes, Sokrates, Demokritos, Platon (dialogues)
- Aristotle: Rhetorics, Poetics
- Workflow: inventio, dispositio, elocutio, memoria, actio

Speech Creating

- Aristotle: Rhetoric, Poetics /part (Mistrik 1976, p. 13)
- 1. Inventio, idea, inspiration, collect material
- 2. Dispositio, ordering, sorting, structuring
- 3. Elocutio, language formulation, stylistics
- 4. Memoria, learning of your speech
- 5. Actio, perform the speech

- Psychology of audience, situation

Aristotle: Rhetoric

- Aristotle: Rhetoric (art of public speaking)
- Language
- Style
- Speech structure

- Different modes: written, oral
- Personality of an author and the listener

Polis & Direct Democracy

- Cities invented to speed up communication
- New spaces – forum and street
- New phenomenon AUDIENCE, voting
- 1 to all: broadcasting
- All to all: gossiping
- All to 1: accumulating
- 1 to 1: dialogue, interaction… GUI

Old Rome Rhetoric

- The greatest rhetor/orator Cicero
- Marcus Tullius Cicero: De Oratore, Brutus…
- Should be persuasive, eventually pathetic, funny
- Always provide arguments
- Carefully select words, ordering of sentences

- Later, religions needed priests, propagandists, and apologets

Rhetoric for Religions

- Monologue, Anknupfungspunkt, homiletika
- Laughter prohibition, Kolakowski: priest vs. clown
- "Did Jesus Christ ever smile?"
- Preacher, gospeler, sermonizer
- Sermon, homily, preach: homilia, apologetica
- Homilia = explain Holy bible texts
- Apologetica = defend some idea
- Goals: H-religion/ethic, A-opinion/differences

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Rhetorics for Academy/Politics

- Lectio = reading, task, (lesson learned)
- Lectio today = talk, plenary talk, keynote talk
- Jan Hus 1415, Martin Luther 1517
- Marat, Robespierre 1794 => speech kills
- National deliberation 19. – 20. centuries
- Marx, Lenin, Hitler, Gandhi

- Rhetorics – classical, baroque, … podcast

Rhetorics Tools

- Anknupfungspunkt, anchor, question, timing
- Verbal tools - economy, dictionary, variability, rhythm…
- Audio – e.g. orthoepic, melody, emphasis and accent, break (silence), intonation
- Kinetic – mimics, gesticulation
- Nonverbal contexts: personality, topic, arrangement, preparation for performance
- There are two TRUE important feedbacks from audience: silent expectation and laughter
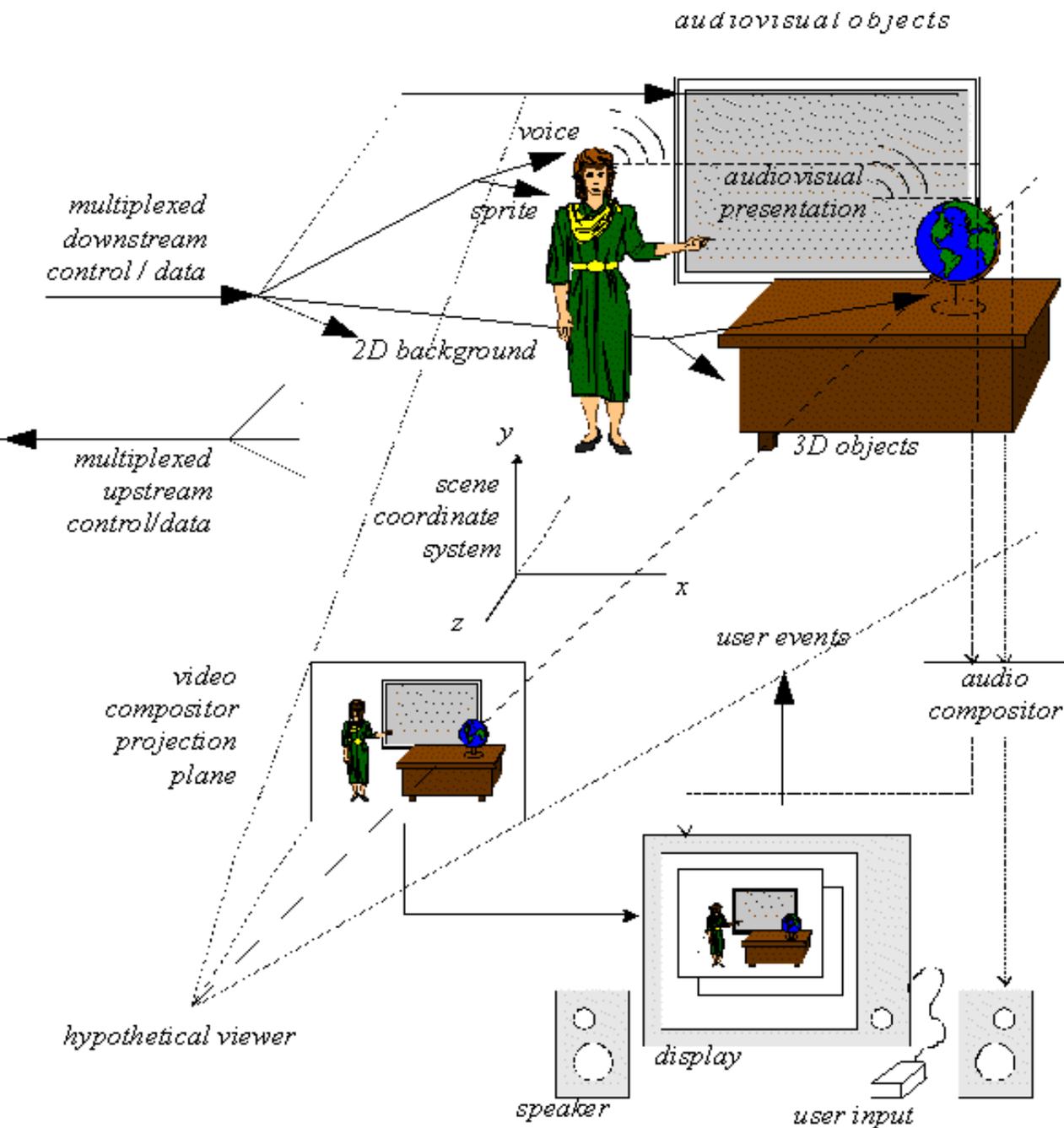
On Model of a Human Being

- The Act of Creation (creatology):

**A
S
H**

AP → GS → WS

AH!

AHA!

HAHA!
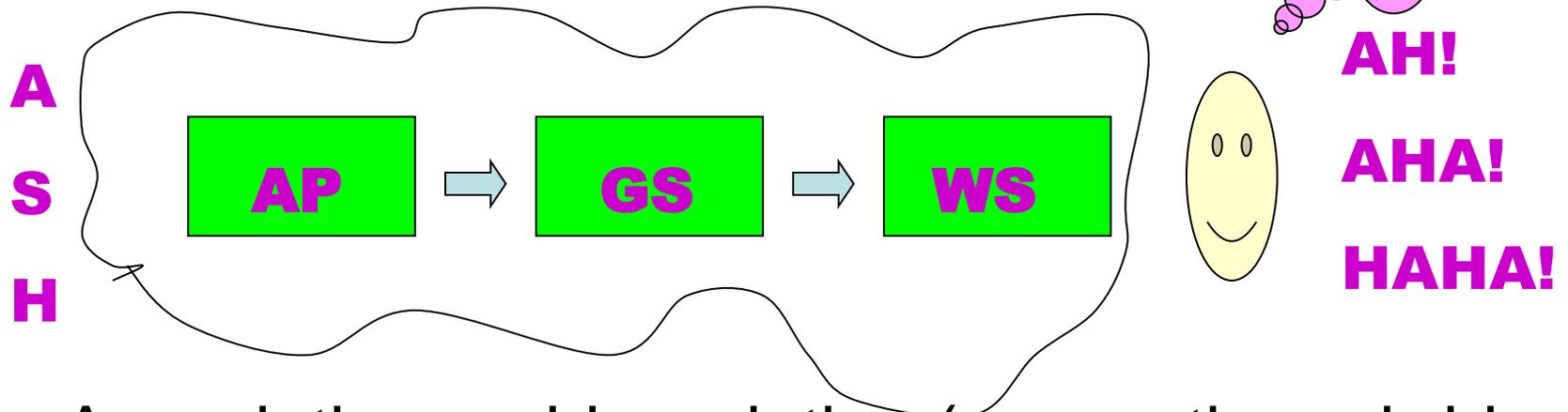
- Association >> bissociation (connection, ~bridge)
- Arthur KOESTLER: no labyrinth, no mouse, just bissociating two contexts

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Human – Human Interface

- The Act of Creation (creatology):
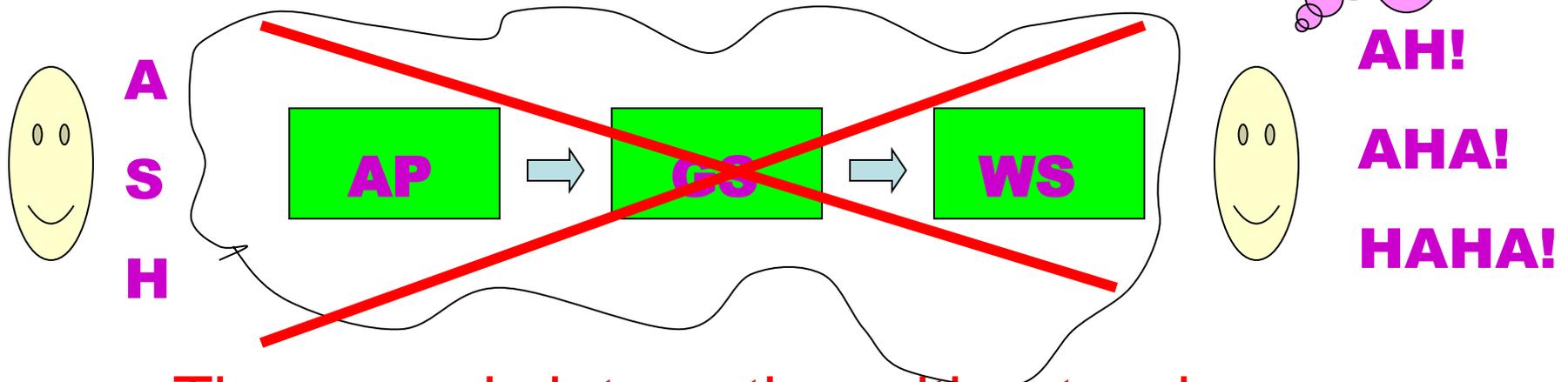
- The same is interesting without web
- Art, scientific discovery, comic inspiration (Humor)
- Note that Humor is undefined like Set or Shape

On Model of a Human Being

- Each human being includes/shares:

- Child, visual, emotional, creative …   **V**

- Adult, symbolic, rational …   **S**

- Parent, auditory, moral …   **A**

- and something "crowded", transactional scenarios

- D. GOLEMAN, Emotional Intelligence. 1998.

Does this exist ?

- ∃?

KUBOID by P. Eliáš

- Э!

KUBOID by P. Eliáš

- http://www.dunako.com/pavol/cuboid/
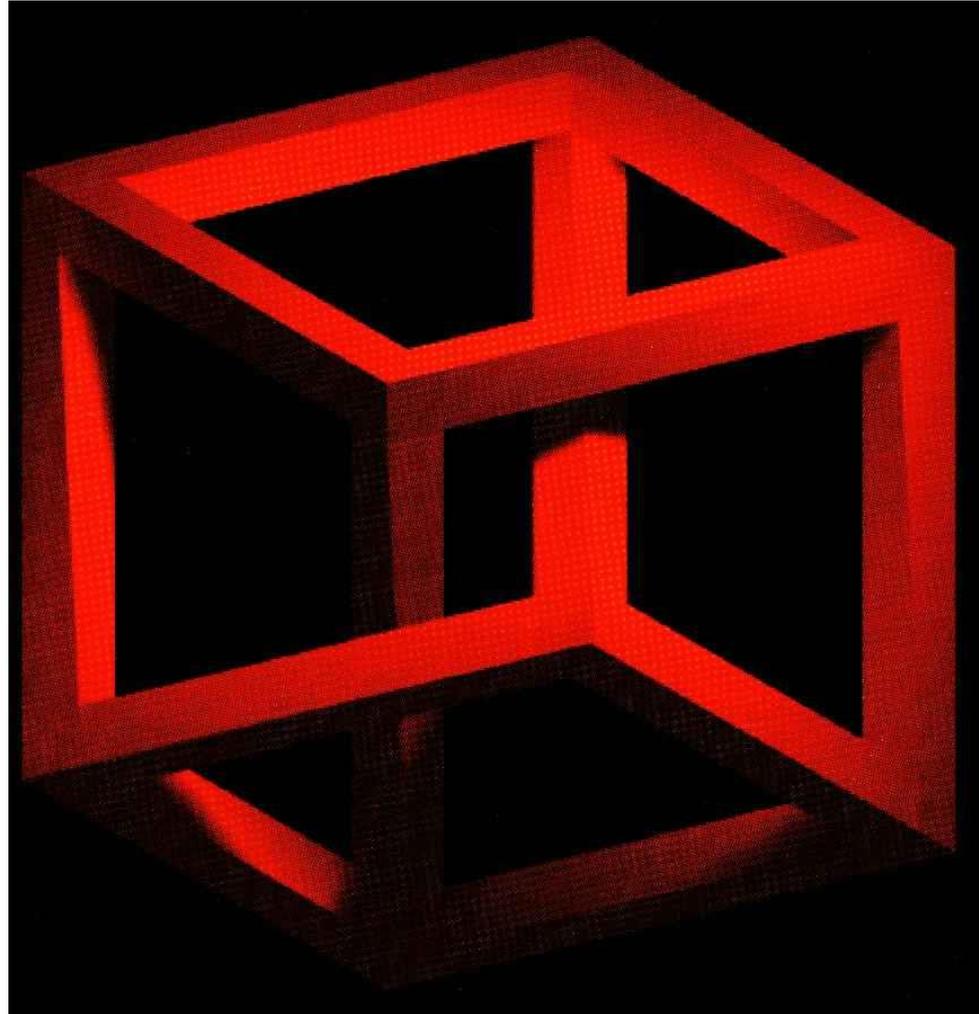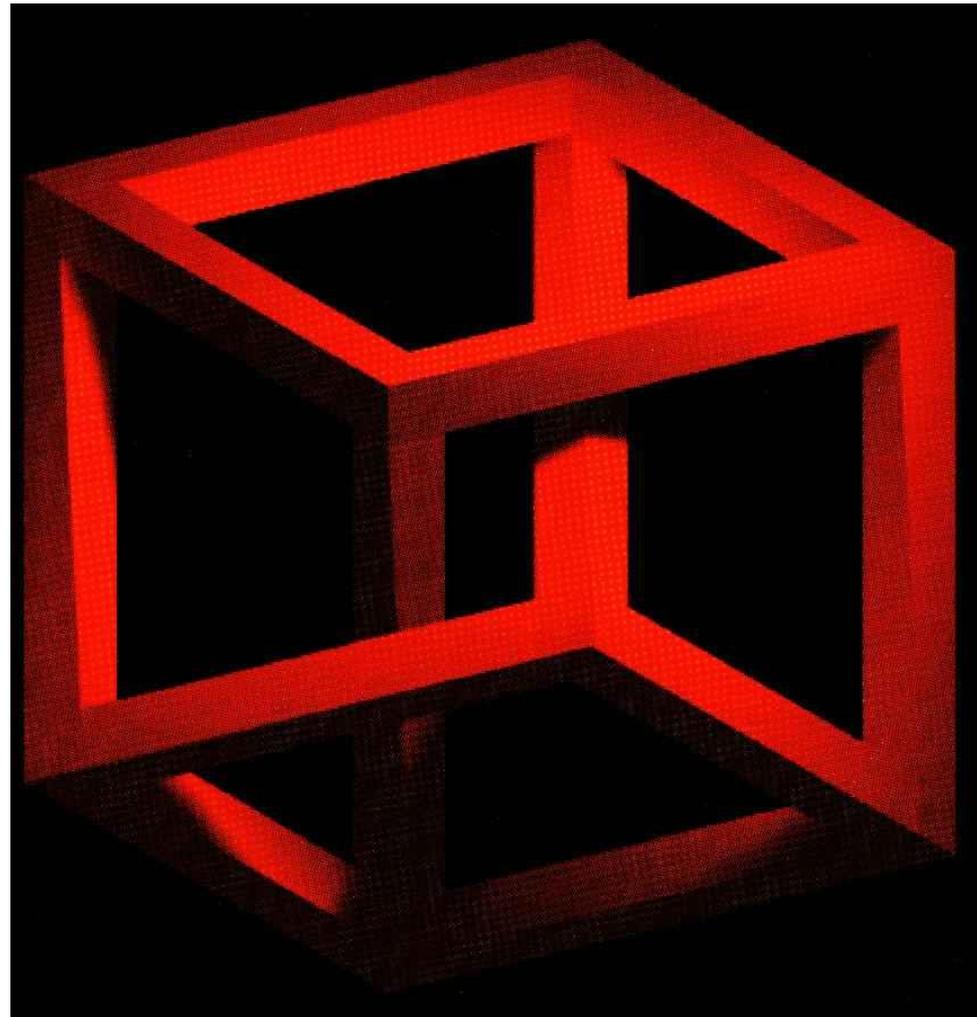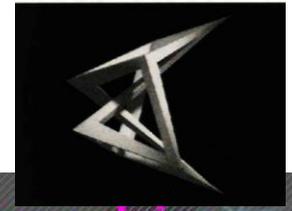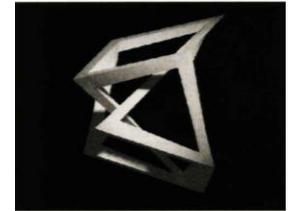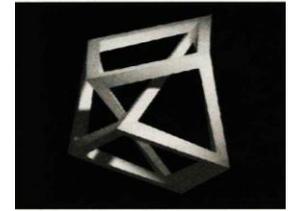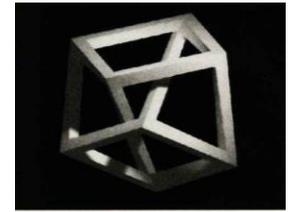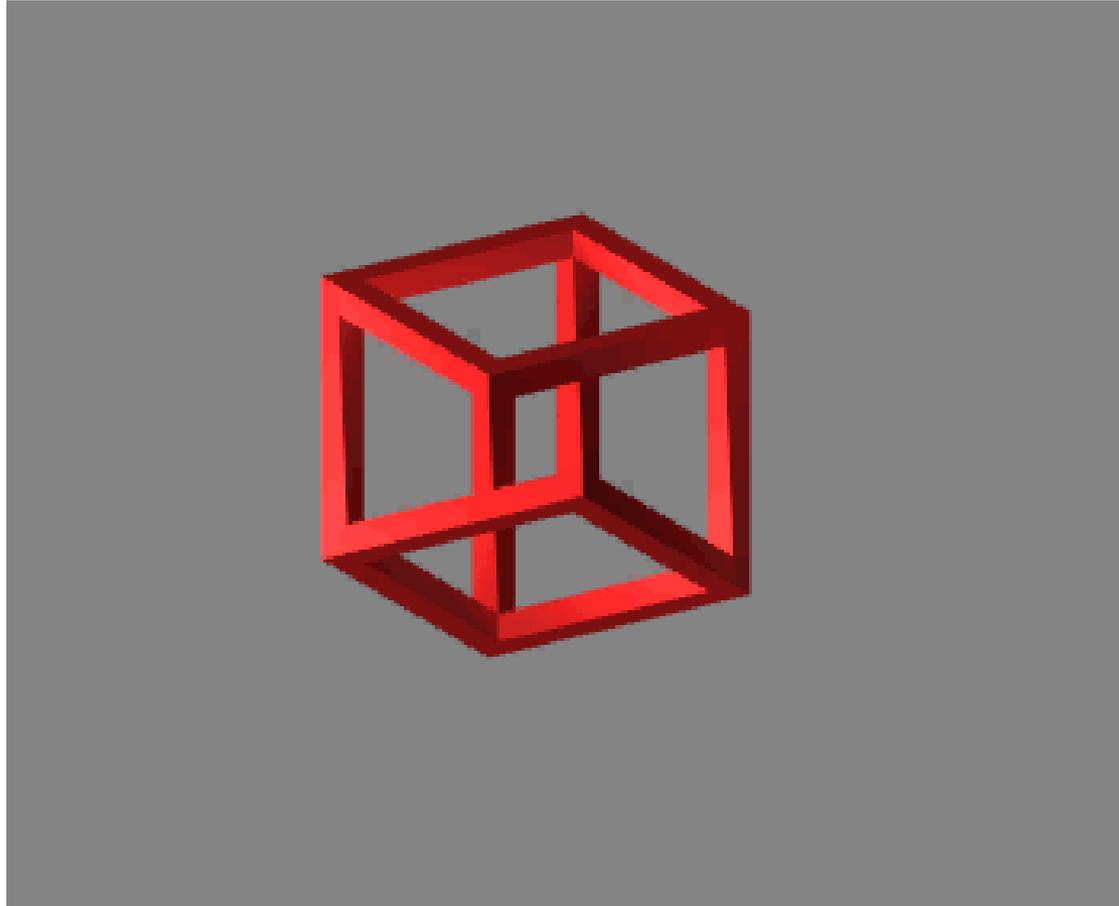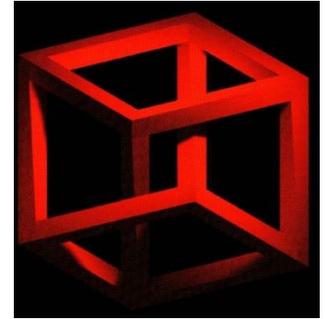
On Model of a Human Being

- Communication World Champions: NLP
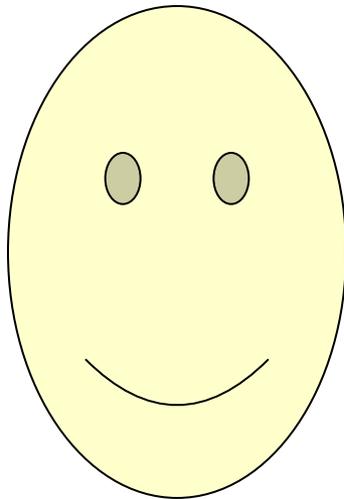
V	➡		Visual
A	➡		Auditory
K	➡		Kinesthetic
O	➡		Olfactory
G	➡		Gustatory

- John GRINDER & Richard BANDLER, 1972+
- NLP = Neurolinguistic Programming

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On Model of a Human Being

- Input Completion: Add Symbolic Channel

S ⇒ Symbolic (glyphs, .exe)
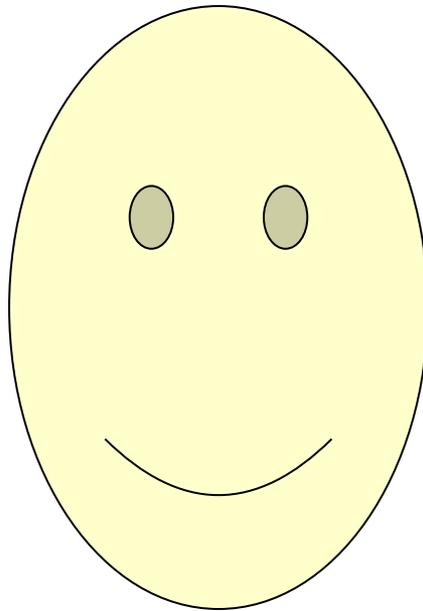
V ⇒ Visual

A ⇒ Auditory

K ⇒ Kinesthetic

O ⇒ Olfactory

G ⇒ Gustatory

-

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On Model of a Human Being

- More from NLP (applied in education, psychotherapy, etc.)
- Elicitation (*open the communication*)
- Calibration, filters
- Anchors, chaining anchors (*attractors*)
- Neurological levels: environment, behavior, capability, belief, identity, spiritual
- O'Connor, J. - Seymour, J. 1989. Etc.

On Model of a Human Being

- More from NLP:
- We use our senses outwardly to perceive the world, and inwardly to 're-present' experience to ourselves…
- The visual system can be used externally when we are looking at the outside world and internally when we are mentally visualizing…
- O'Connor, J. - Seymour, J. 1989. Page 44.

On Model of a Human Being

- More from NLP:

- Preferred representational systems

- Eye accessing cues - eye movements show how we are thinking: visualization, visual constructed images, visual remembered images, constructed sounds, remembered sounds, kinesthetic, auditory digital (internal dialogue)

- O'Connor, J. - Seymour, J. 1989. Page 52.

On Model of a Human Being

- More from NLP:
- Visual submodalities: associated or dissociated, colour or black and white, contrast, clarity (blurred or focused), movement (like a film or slide show), speed (faster or slower than usual), number (split screen or multiple images), size...
-
- O'Connor, J. - Seymour, J. 1989. Page 58.

On Model of a Human Being

- More from NLP (applied in psychoterapy, etc.):
- Elicitation (*open the communication*)
- Calibration, filters
- Anchors, chaining anchors (*attractors*)
- Neurological levels: environment, behavior, capability, belief, identity, spiritual
- O'Connor, J. - Seymour, J. 1989. Etc.

Semiotics

- Sema = meaning ~ importance (Mistrik 1976, p. 31)
- Semiotics, study of sign systems in nature and society
- Using signs, people & animals communicate
- Signs, natural, artificial/conventional
- Natural: smoke (sign of a fire), cry (pity, sorrow, compassion), lightning (sign of a storm)

Gap Filling

- Gap in time ~ nonstrutured time perception
- Horror vacui, fear from empty space
- Structuring time, hunger for structure (Berne)
- Giving speech structures the time
- Gnomic time ~ out of time, unlimited, $E=mc^2$
- ?Hierarchy 1. New info fills itself, 2. Gaps in new filled from old and vice versa, 3. Intergaps (old/new interactions)

Gap Filling Goals

- Reproduction ~ copy, imitate (given mem)
- Validation ~ prove/accept, disprove/reject
- Light shed analogy ~ direct, indirect (rotating light source), mirror 1:1, scale, reverse –X, 1/X, logX…
- Iconic, indexed, symbolic, signal, symptome representations => semiotics

Semiotics Fundamentals

- Sign includes iconic, indexed, symbolic, signal, symptom and other representations which serve to communicate

- Signal communicates time and has no connection with content of given message

- Signals in theatre – curtain up and down

- Ringing bell in the school, barking dog, …

- Bounce in Japan, show/give hand in Europe

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Semiotic Triangle

- Sign

Idea, denotation
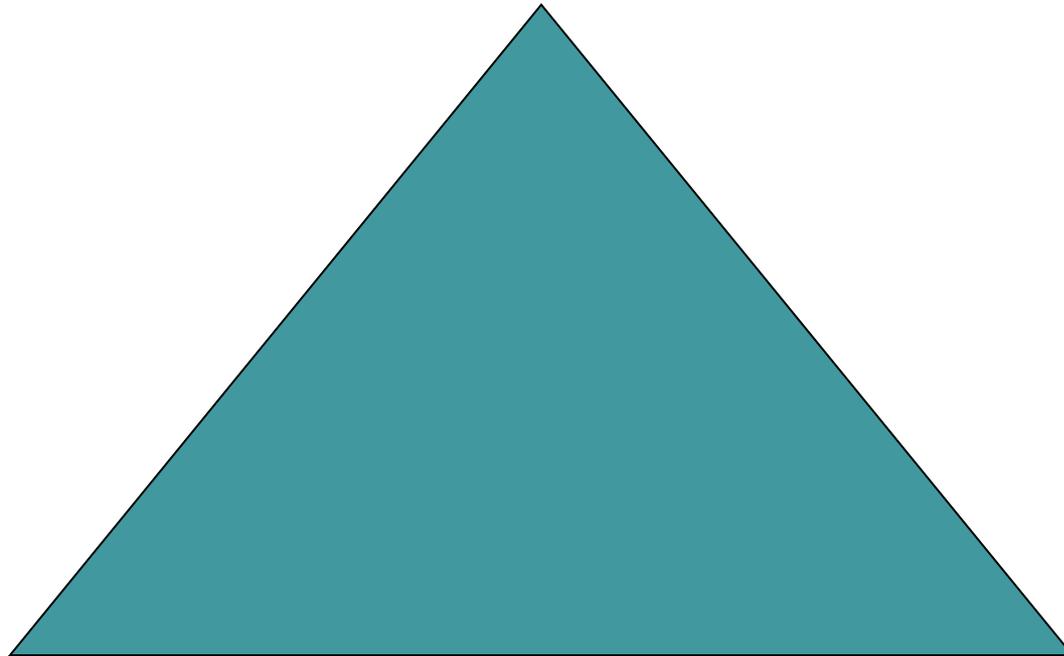
Signifiant, designans, form   Signifié, designatum, content

Inverse Problem

- **Ambiguity => no unique solution**
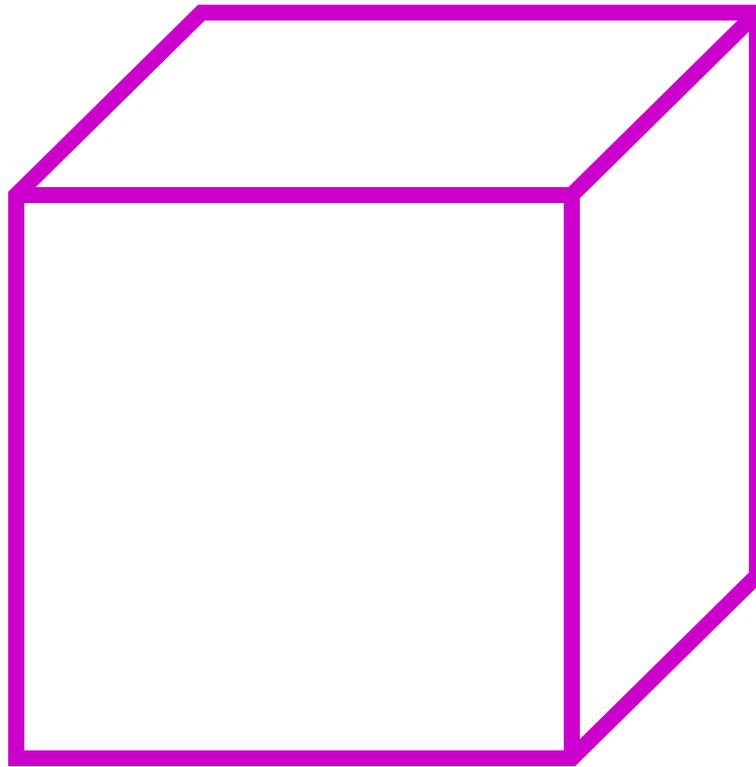
Iconic Representation

- Ostension, show, demonstration in chemistry
- Blue liquid is blue liquid ($CuSO_4$)
- Mona Lisa is Mona Lisa, original!!!
- Apple is apple, a=a? (Durrenmat)
- Stecak is stecak, its photo is its photo
- Hot taste is hot taste
- Visual, acoustic, kinesthetic, oftalactive, gustative – the first signal system, any child

Index

- Index points to MORE content
- Pars pro toto, part for the whole, e.g., for example
- 28 in PowerPoint is an index for all font sizes
- Index is a representative of a given set
- Hypertext link is an index for more data
- Index is a "zipped" form of a sign, so to say
- Index cannot be understood by a very little child
- Sequence of still photos in a movie Run, Lola, Run

Symbol

- Symbol represents something else
- It is motivated by the content
- Glyphs: ABC, scores, chemistry, street signs…
- Symbol can communicate very complex content
- Beethoven's g-g-g-s symbolizes bad fate
- Wedding march symbolizes wedding
- Head movements symbolize yes/no (Bulgaria)
- Empty square at the stage symbolizes conflict

Creating Symbols

- We can create new symbols by repeating
- Logo design, state flag design, font design…
- We enter a competition for new mems
- Invent new name 4 your story (Forrest Gump,CSI,Matrix...)
- Symbolize SSST by a jingle
- What about S3T (pronounce street)?
- Which of PowerPoint indexes are symbols, too? FloodFill combines both (color/method)

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Symptom

- While symbol denotes, symptom indicates something hidden, guess, hypothesis…
- Symptom of disease… weather…
- Symptom ~ abduction

- Sign includes iconic, indexed, symbolic, signal, symptom and other representations which serve to communicate

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Semiotics Easier in Sound

- Sound 3 categories: speech, music, non-speech audio cues (beeps and buzzes)
- Imitating reality >> iconic representation
- Index, indexed representation, pars pro toto
- Convention >> symbol
- Signal, context dependent
- Examples: BELL (sound) is a signal or iconic rep.
- DVD is a symbol of music or index in e-shop
- Icons=icons, A for all letters, names, dialogue box

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Semiotics Harder in Music

- Susanne K. Langer: On Significance in Music 1993, p. 45 in Slovak translation, Bratislava: SNEH 1998

- "The meaning of music is never fixed"

- In other words, there is no vocabulary

- In another words, the meaning is communicated by structure with music

- J. Mistrik even states: Semiotic system of music is so rich, that it cannot be decomposed into elements

Semiotic Systems

- Music – one of the hardest ones
- The simplest – yes/no, 2 items vocabulary/meaning
- Symbolize them by head movements, Y/N…
- Symbolize them by numbers? 5 = NO
- 12 = YES
- This works, in integrated circuits, 5V = logical zero in your computer, 12V = one/true/yes
- Emperor's thumb in circus up/down => kill him!

How Many Semiotic Systems?

- How many semiotic systems to direct?
- Up to 13 different ones in theatre after (Mistrik 1976, p. 31)
- Less in TV play
- Unknown for virtual museum
- Perfect use of sound semiotic system in Geri's Game
- Virtual reality is a semiotic system and soun semiotic system in use is named there sound space
- Director – proper symbiosis of semiotic systems and proportional representation of them makes the speech important, sugestive, and efficient (enthymeme)

Power of Non-verbal

- This is the result of your long-lasting cooperation.
- 6 different meanings by intonation only:
- Announcement, question begin/end, cry, ironic, reprimand
- Brecht reversed meanings of all lines in whole play!

- This is the result of your long-lasting cooperation.

Geri's Game/Sound
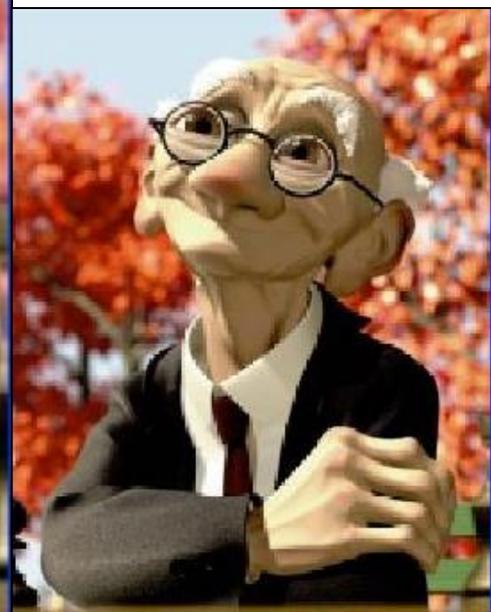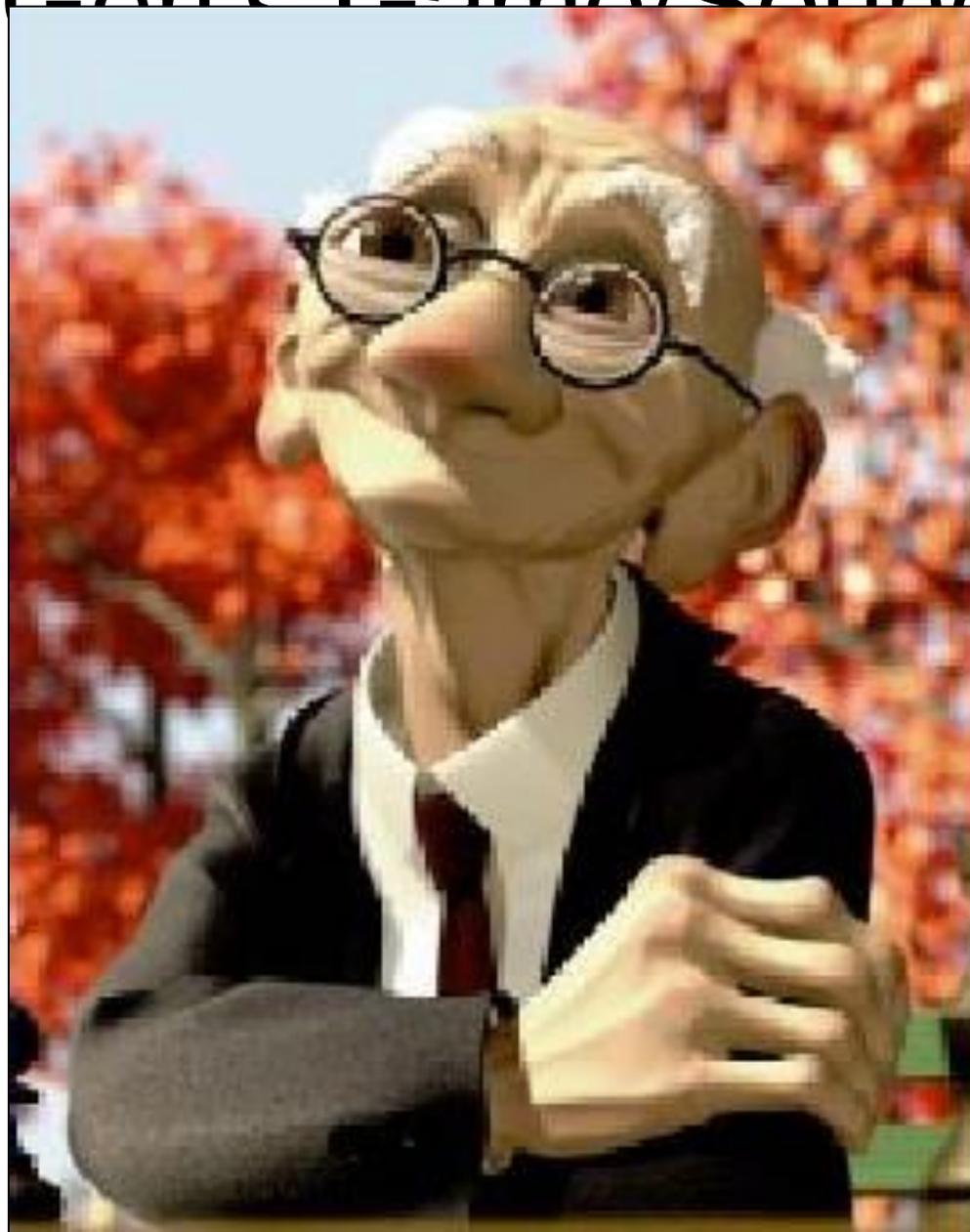
GG Sound Space

- Music
- „Speech"
- Real Sounds
- Symbolic Sound
- Symptoms?

Ethos, pathos, logos

Back to Aristotle & virtual museum: CAMERON–KENDERDINE 2007. *Theorizing Digital Cultural Heritage.* (p. 263):

- Understanding of our audience in 3 layers
- The ability of the rhetorician
- To appear credible and trustworthy, so as to be persuasive – ETHOS
- To evoke emotion in her/his audience through the way of communication and consequently energizes them into action – PATHOS
- To persuade by "systems of reasoning" or mostly by means of logic – LOGOS

On Model of a Human Being

- Each human being includes/shares:

- Child, visual, emotional, creative …   **V**

- Adult, symbolic, rational …   **S**

- Parent, auditory, moral …   **A**

- and something "crowded", transactional scenarios

- D. GOLEMAN, Emotional Intelligence. 1998.

Enthymeme

- **Aristotle devised these criteria - ethos, pathos, and logos – relying on "rough empirical generalizations about the psychology of various types of audiences. His theoretical framework could be applied to the virtual landscape and it's communication, as we observe audience's reactions to various elements of a virtual museum.**

Aristotle's most important statement about the central role he granted the audience was intricately linked to the importance he attached to the *enthymeme* in the act of persuasion. He considered the *enthymeme* to be the "strongest of the proofs," the "body of persuasion," as the audience is most easily persuaded when they think that a certain matter has been demonstrated (Rapp 2002). Aristotle called *enthymeme* a "rhetorical syllogism" (Covino 1995, 21). An *enthymeme* leaves out the second premise that is already accepted by the audience, due to commonsense knowledge or a shared ideology and set of values. For example, the following is a syllogism: All beings are mortal. Socrates is a human being. Socrates is mortal. As an *enthymeme*, this would become:

Enthymeme Gap Filling

- All beings are mortal, and Socrates is mortal.
-
- Here the gap filling works.
- All beings are mortal. <u>Socrates is a human being.</u> Socrates is mortal. (Gap underlined by AF, gap filling added by AF).

- This kind of gap filling, named enthymeme, Aristotle saw as the strongest of all arguments because it involves <u>both</u> audience and speaker in a joint enterprise. (Underlined by AF).

Enthymeme Directing

- The general idea remains the same in speech, radio play, theatre, movie, computer game and virtual museum – the author(s) and audience reach a conclusion together – a conclusion which is already known by the authors, who have given their audience the necessary means to reach it.
- In particular, the complete interaction works in this direction.
- So, what are all the gaps?

Gaps

- Sorting facts for non-fiction story/talk/back-telling

Reality: existing, non-existing
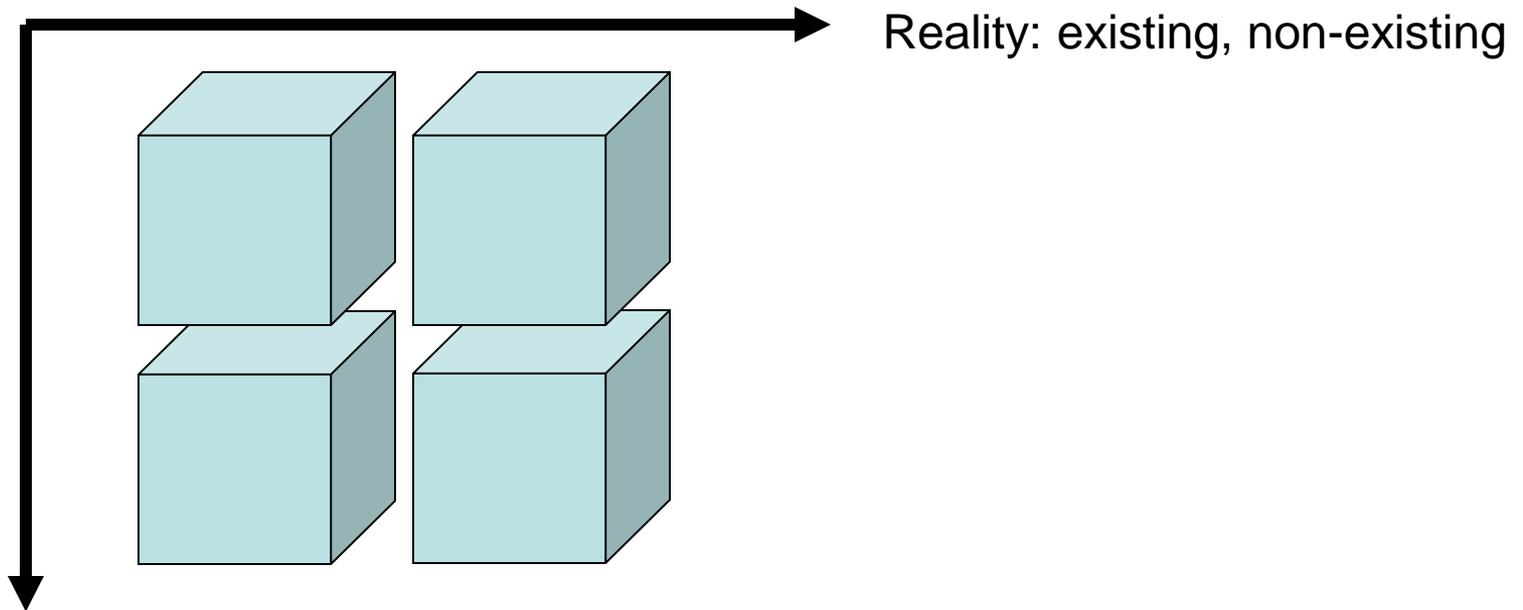
Your Story: existing, non-existing/ Your choice, mindscape, chronotope

Gaps Existence/Phantasy
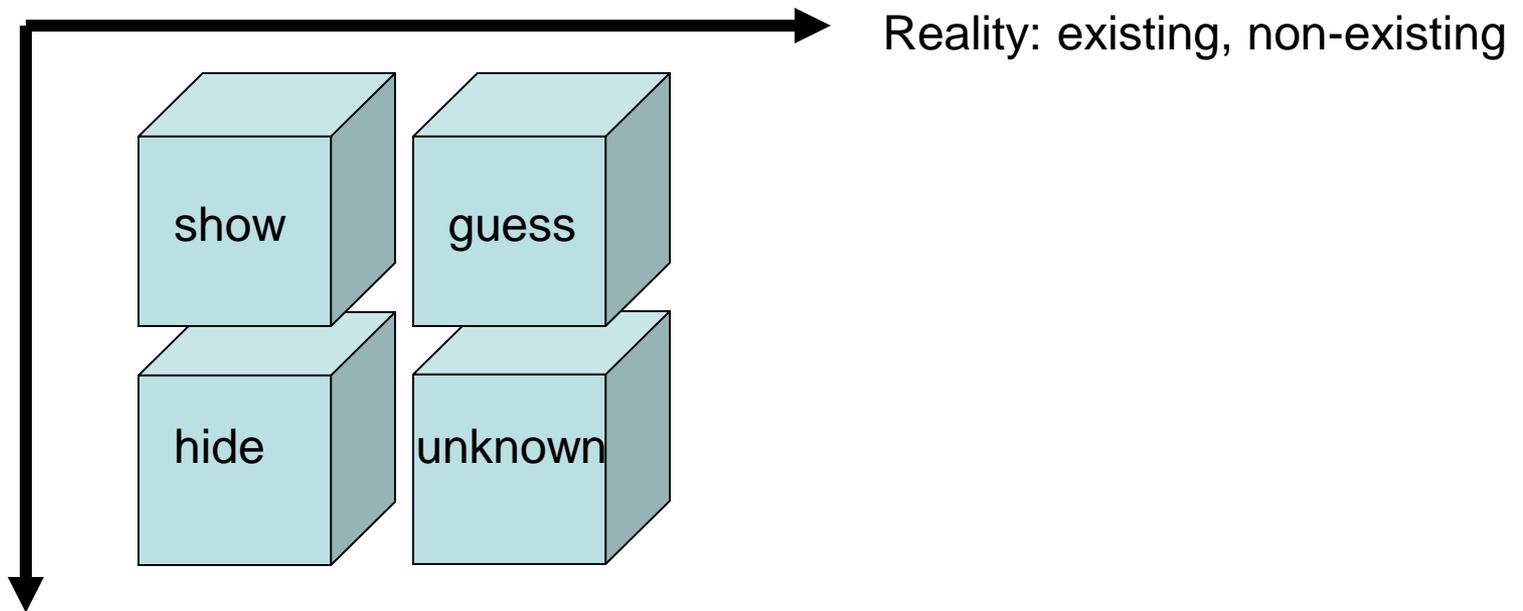
- Sorting facts for non-fiction story/talk

Reality: existing, non-existing

show	guess
hide	unknown

Your Story: existing, non-existing/ Your choice, mindscape, chronotope

- What means the third dimension?

Time?

- Can be (and it is)

Gaps Existence/Phantasy
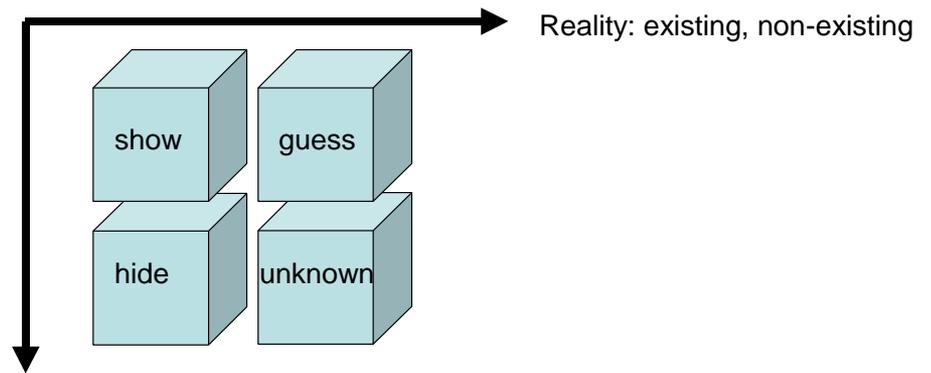
- Sorting facts for non-fiction story/talk

Reality: existing, non-existing

show   guess

hide   unknown

Your Story: existing, non-existing/ Your choice, mindscape, chronotope

- What means the third dimension?

- What about metaprograms?

Time? Metaprograms? People?

- Timing

- Metaprograms

- People, personas

Gaps Existence/Phantasy

- Sorting facts for non-fiction story/talk

Reality: existing, non-existing

show | guess
hide | unknown

Your Story: existing, non-existing/ Your choice, mindscape, chronotope

- What means the third dimension?

Gaps Existence/Phantasy

- Sorting facts for non-fiction story/talk

Reality: existing, non-existing

show | guess
hide | unknown

Your Story: existing, non-existing/ Your choice, mindscape, chronotope

- What means the third dimension?

AH!, AHA!, HAHA!

Unknown

- Sorting facts for non-fiction story/talk/back-telling

Reality: existing, non-existing

… Hic sunt Questions

Your Story: existing, non-existing/ Your choice, mindscape, chronotope
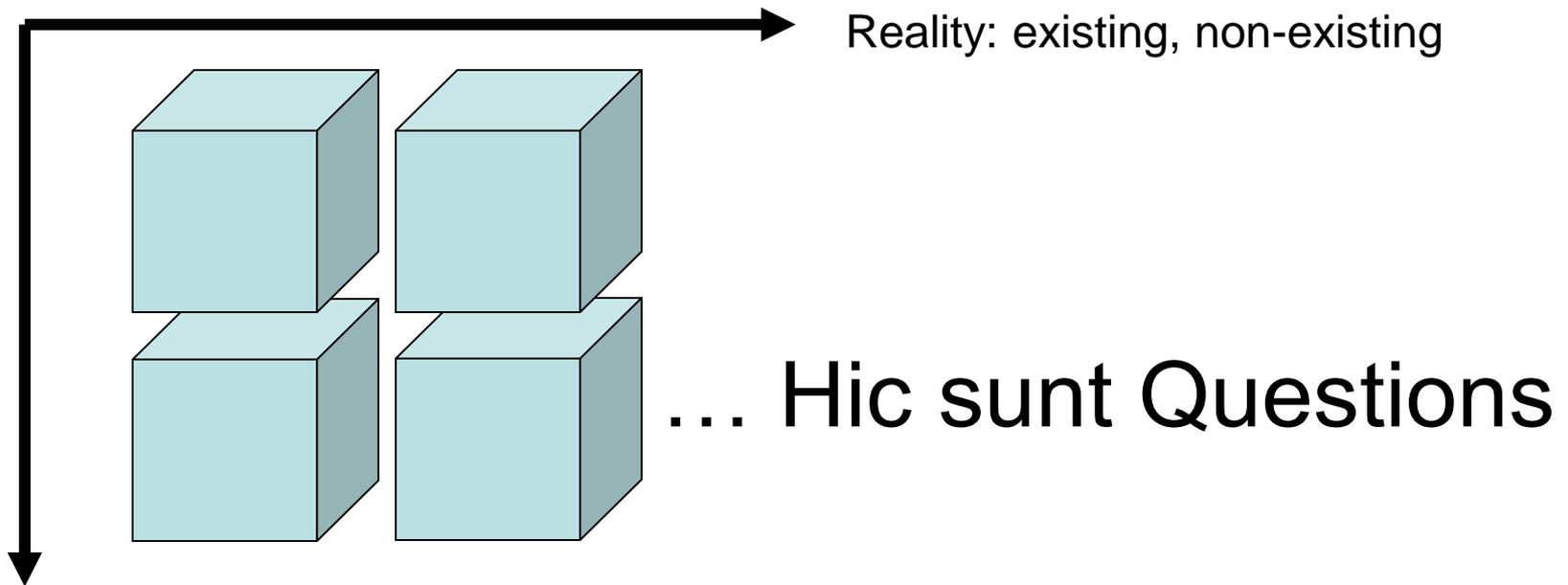
Black/White Box Spectrum

- Sorting facts for non-fiction story/talk/back-telling

Reality: existing, non-existing

Rather than 0/1 continuum in mindscape
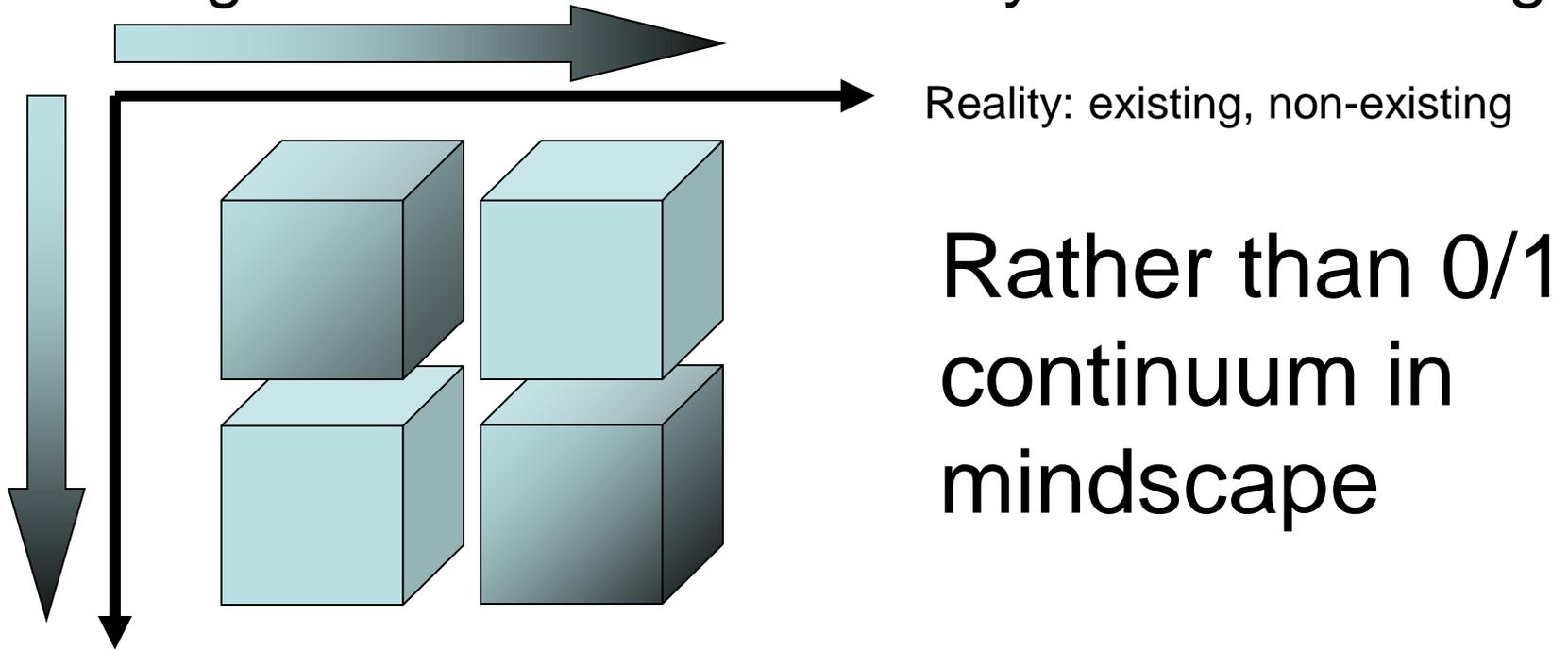
Your Story: existing, non-existing/ Your choice, mindscape, chronotope

Serious Unambiguous Messages

- White box… Black Box: known to unknown
- Problem, model, algorithm, software, results…
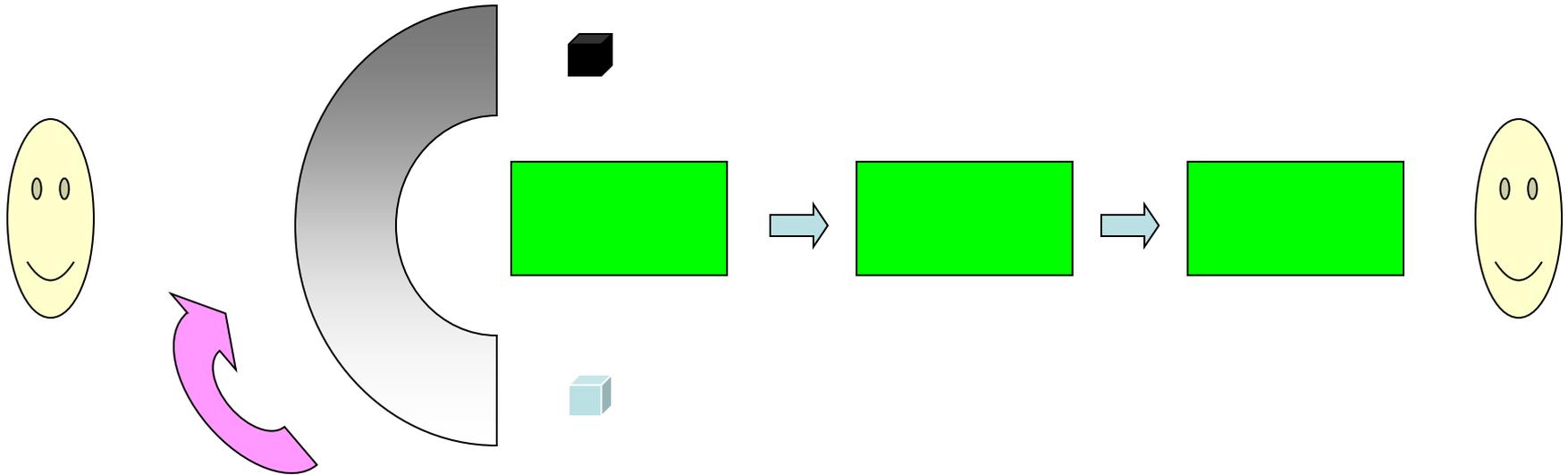
- Knowledge++ **(electric circuits… CFD… Big Bang/humor theory)**
- Labyrinth and Mouse
- (standard brainstorming creatology)

Maslow's Hierarchy of Needs

- Pyramid of needs by Maslow (Glassner, p.77)
- Transcendence, self-actualization
- Aesthetics, cognition
- Esteem, belonging and love, safety and security, physiology

246 Questions to Analyze

- Based on JAMES, T. *Analyzing Text for Actors, Directors, and Scenographers.* Focal Press 1992. (Scherhaufer, p.324)

- Time, place, society, background of story
- Plot, structure, character, complexity
- Dialogue, theatrality, tempo, rhythm, mood
- Style

- NEW!!! Recent paper on **automatic script analysis**: Murtagh 2008 >> dendrogram

Yet Another Aspect

- Having a gap in given time t_0
- One may think really, having real model
- One may think inversely, ironically, however
- Direct communication is a standard, described by theory of information, source/author, destination/audience, channel, lexically, syntactically, semantically, semiotically, even anagogic, but!
- What about indirect communication?

Two Gap Families

- What about indirect communication?
- A gap can be intentional by an author or recognized by the reader (unintentional)
- I-gap can be perceived or cannot
- U-gap can be accessed by the author at anothelr level of immersion or cannot (given by cultural capital of author)

SemiGap ?

- What if there is no gap at both sides?
- This is the case of error or difference or unceratinty…
- E.g. in former Czechoslovakia people believe that Gavrilo Princip shooted SEVEN shells
- In fact, they were 2
- "Seven balls like in Sarajevo" is the wrong sentence in a popular novel on brave soldier Svejk… and this is fixed, maybe forever

Another Gaps…

- Dualities
- Bridging Two Contexts – bisociation
- Combining two parts of cultural capital – static data and dynamic methods
- Logical gaps in movies – cover or magnify
- E.g. by McKee, p. 372 – Terminator and Casablanca
- …

Model of a Joke
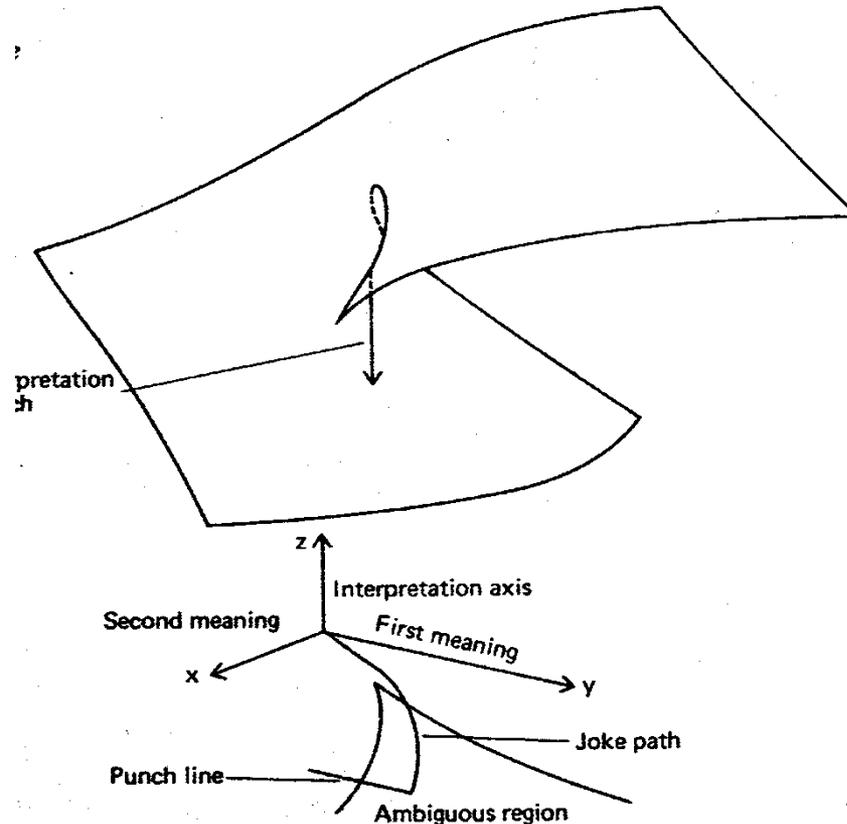
- A catastrophe theory model of joke, J. A. Paulos

Ambiguity...

- **Meanings**
- **Signs**
- **Semiotics...**
- **Bakhtin theory:**
- **Popular culture**
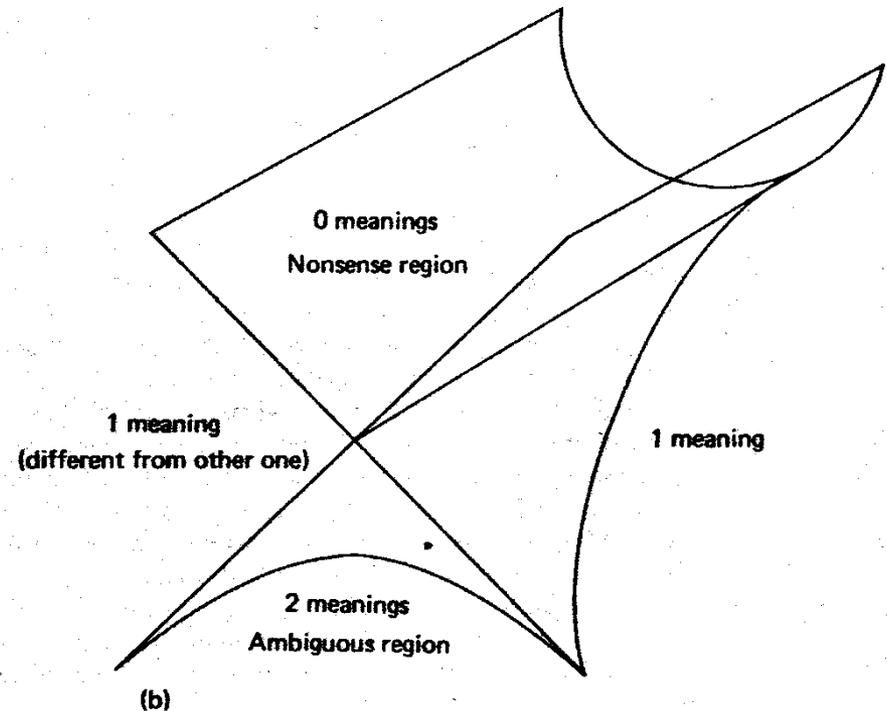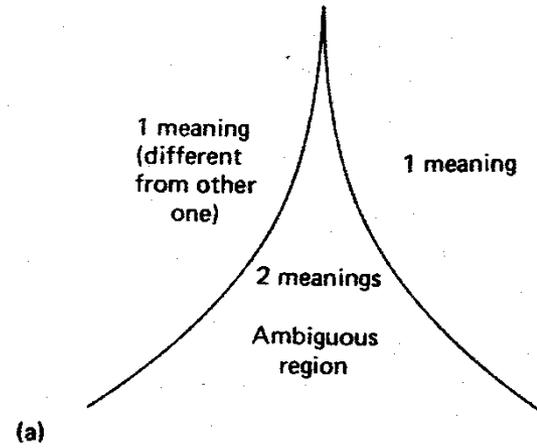
1 meaning
(different
from other
one)

1 meaning

2 meanings

Ambiguous
region

(a)

0 meanings
Nonsense region

1 meaning
(different from other one)

1 meaning

2 meanings
Ambiguous region

(b)

Categories of Ambiguous Web Graphics

- Categories of ambiguous messages created and communicated by web graphics:

- **static** (stills) and **dynamic** (animations, interactive 3D worlds)

One view

2+ views

N views (using mirrors)
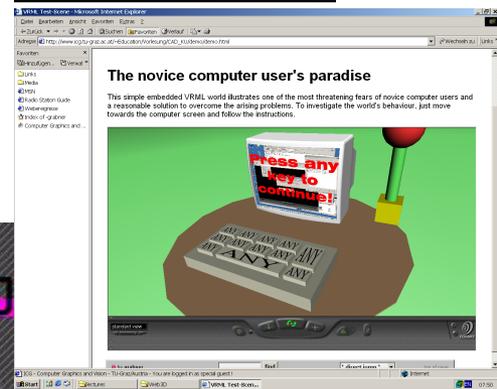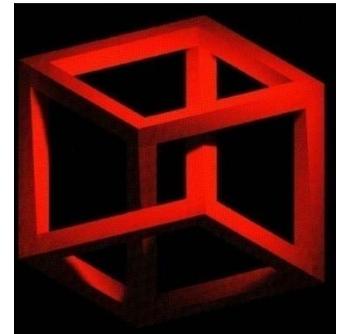
Even the Interactive Ambiguities
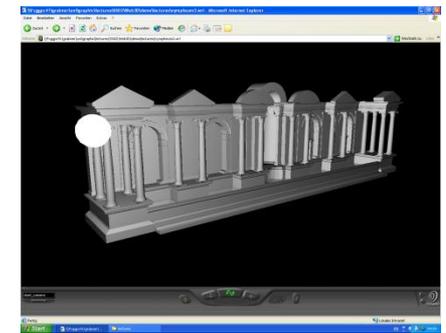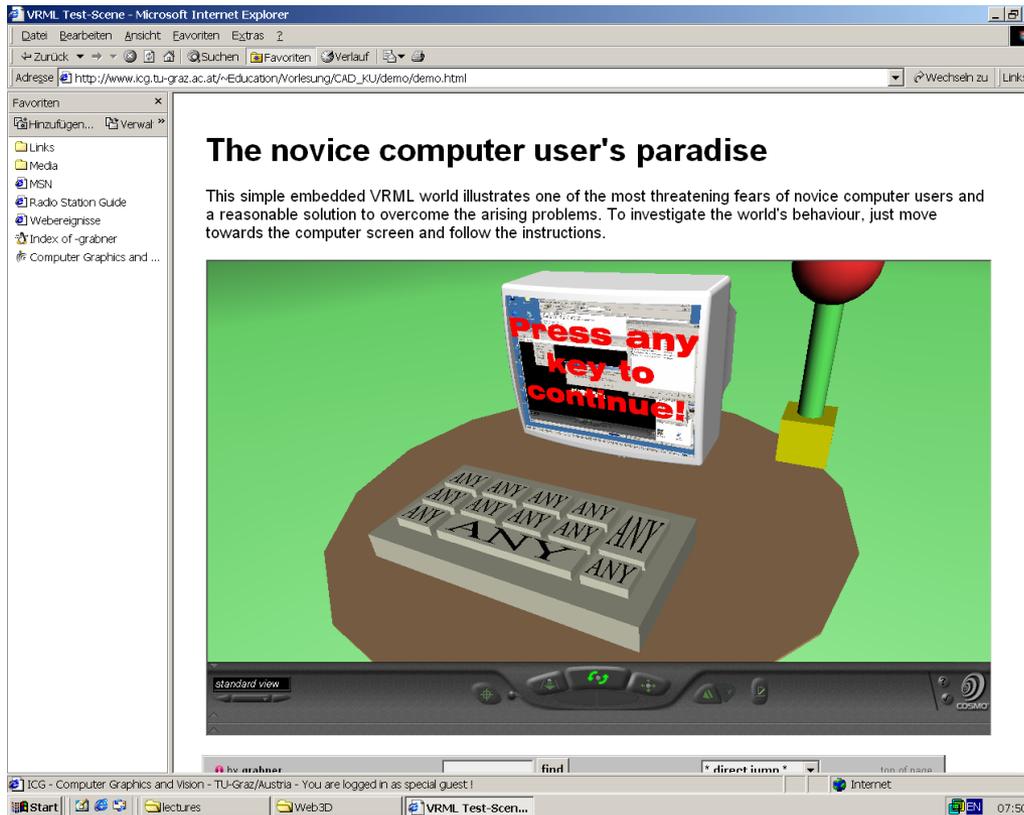
- VRML worlds by M. Grabner, TU Graz 2002

The Elements of User Experience
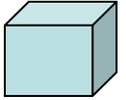
- **A basic duality:** The Web was originally conceived as a hypertextual information space; but the development of increasingly sophisticated front- and back-end technologies has fostered its use as a remote software interface. This dual nature has led to much confusion, as user experience practitioners have attempted to adapt their terminology to cases beyond the scope of its original application. The goal of this document is to define some of these terms within their appropriate contexts, and to clarify the underlying relationships among these various elements.

Semantic Web

- **The end of WWW**
- **BERNERS-LEE, T. et al. 2001. The Semantic Web. *Scientific American*, May 2001.**
- **Ontology, AI, avatars & autonomous agents**
- **Information (digital libraries) vs. Knowledge & creativity support (semantic web)**
- **Dilema ☺ (thesis, antithesis, synthesis)**

Rennaissance Analogy 4 WWW

- **Guttenberg, Rabelais, Bakhtin**

- **Tim Berners-Lee, ?, ??**

-

- **Rennaissance team**

Theory of Information

- Measure of information: entropy H, logarithm of reversed value of probability of i-th sign

- $H = -\log p_i$

- If $p_i = 1 \Rightarrow H = 0$, 100% expectation provides no information, repeating increases probability and decreases information content of message (Bertok, p. 38)

- Redundancy of message, etc.

Numerical Aesthetics

- Surprise – no surprise by John Cage's 4'44'', Four minutes and 44 seconds of silence for piano", maximum redundancy,

- Zero redundancy – random music

- Eye-catching maximum ~37 %, e.g. dominant color in a paintnig covers about 40 % area

Theory of Appraisal

Back to virtual museum: CAMERON–KENDERDINE 2007. *Theorizing Digital Cultural Heritage.* (p. 265, 276):

- Relatively new research ~ 15 years
- Provides means to measure the success
- Gives – with rhetoric - double theoretical framework, and a MEASURE
- Attitude, engagement, graduation
- Visits/Visitors*Duration ~ engagement factor
- Actionable metric – in time, VM Canada

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[Boro08] BOROVSKÝ, P. – SAMUELČÍK, M. - NOVOTNÝ, M. – STANEK, S. — LACKO, J. – FERKO, A. 2008. 3D Multimedia Historic Bratislava. *CORP 2008: Urban Planning and Regional Development in the Information Society.* Schwechat-Rannersdorf: Competence Center of Urban and Regional Planning, 2008. - ISBN 978-39502139-5-9. - pp. 525-530.

[Came07] CAMERON, F. – KENDERDINE, S. eds. 2007. *Theorizing Digital Cultural Heritage.* ISBN 0-262-03353-4. Cambridge: MIT Press 2007.

[Lebe07] LEBERL, F. W. 2007. Internet-inspired Urban Models. Comenius University Talk. Bratislava 18. 10. 2007.

[Norb81] NORBERG – SCHULZ, Ch. 1981. *Genius loci, k fenomenologii architektúry.* ISBN 80-207-0241-5. Czech translation by Petr Kratochvíl and Pavel Halík from London 1981 edition by Academy Editions. Praha: Odeon 1994.

[PMZA08] *Virtual Museum Portal of Považské múzeum Zilina.* [online] At www.pmza.sk (October 8, 2008.)

[Qvor01] QVORTRUP, L. *ed.* 2001. *Virtual Interaction: Interaction in Virtual Inhabited 3D Worlds*. ISBN 1-85233-331-6. London: Springer 2001.

[Qvor02] QVORTRUP, L. *ed.* 2002. *Virtual Space: Spatiality in Virtual Inhabited 3D Worlds*. ISBN 1-85233-516-5. London: Springer 2002.

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[Aris01] ARISTOTELES. 1944. *Poetika.* Slovak translation. Martin: Matica slovenská 2006.

[Bern01] BERNERS-LEE, T. *et al.* 2001. *The Semantic Web.* Scientific American. [online] At http://www.sciam.com/article.cfm?articleID=00048144-10D2-1C70-84A9809EC588EF21, May 2001. (October 8, 2008.)

[Boro08] BOROVSKÝ, P. – SAMUELČÍK, M. - NOVOTNÝ, M. – STANEK, S. — LACKO, J. – FERKO, A. 2008. 3D Multimedia Historic Bratislava. *CORP 2008: Urban Planning and Regional Development in the Information Society.* Schwechat-Rannersdorf: Competence Center of Urban and Regional Planning, 2008. - ISBN 978-39502139-5-9. - pp. 525-530.

[Came07] CAMERON, F. – KENDERDINE, S. eds. 2007. *Theorizing Digital Cultural Heritage.* ISBN 0-262-03353-4. Cambridge: MIT Press 2007.

[Geis05] GEIST, B. 2005. *Akustika.* ISBN 80-86253-31-7. Praha: Muzikus 2005.

[Halu04] HALUSKA, J. 2004. *The Mathematical Theory of Tone Systems.* ISBN 0-8247-4714-3. New York: Marcel Dekker 2004.

[PMZA08] *Virtual Museum Portal of Považské múzeum Zilina.* [online] At www.pmza.sk (October 8, 2008.)

[Sche01] QVORTRUP, L. *ed.* 2001. *Virtual Interaction: Interaction in Virtual Inhabited 3D Worlds.* ISBN 1-85233-331-6. London: Springer 2001.

[Qvor02] QVORTRUP, L. *ed.* 2002. *Virtual Space: Spatiality in Virtual Inhabited 3D Worlds.* ISBN 1-85233-516-5. London: Springer 2002.

Time in Multimedia

- Virtual Interaction by Qvortrup (2001, p. 371n): description of the narrativity
- Two kinds of series
- Discourse structure (dialogue, interaction)
- Event structure (not very interesting in dictionary)
- Developer's perspective => events
- User's perspective => discourse

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Temporal Logic (McTaggart 1927, Prior 1972)

- A-logical notions: past – present - future

- B-logical notions: earlier, later, "simultaneous with"

- Discourse structure (dialogue, interaction)

- Event structure (not very interesting in dictionary)

- Developer's perspective => events, case B

- User's perspective => discourse, case A

- What is real? Dialogue has the „nowness"

Time, causality, truth

- temporal = causal ???
- Truth should be understood as <u>relative</u> to temporal instants
- The present is the real considered in relation to two particular species of unreality, namely past and future (A.N.Prior 1972)
- Developer => events
- User => discourse, click => TWO pasts

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Timing of the Action

- How the visual actions are timed to the story, Kerlow, p. 203, keeping the interest
- Ahead of the story, e.g. reaction to the off-camera sound, something will happen before we know what it is
- Behind the story, audience knows before the character, e.g. falling piano, comedy, Moliere triangle
- Interrupted and parallel actions
- Temporal gaps

• Final Fantasy

Opel OMEGA
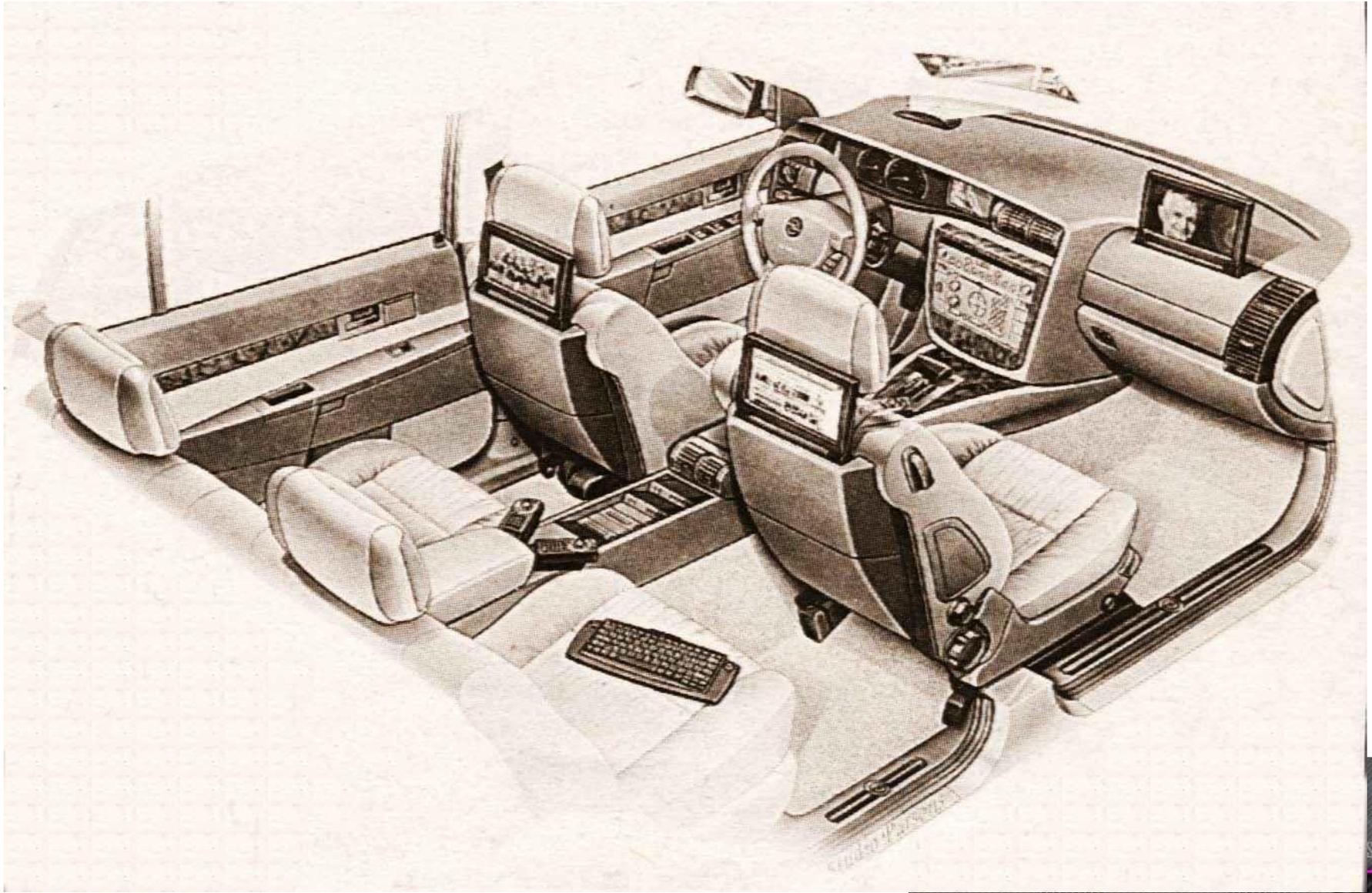
IT future by prof. Plander

- **Technology: micro 2012, opto, nano, quantum**
- **Parallel & distributed computing: WWW, GRID**
- **AI ~ brain 10E10 .. 10E12 neurons, slow but...**
- **e.g. HVS 5 human faces a second**
- **Autonomous agents online**
- **CERN 10E15 bytes/year (petabytes)**
- **Bremermann's limit 10E93 bits by a hypothetical computer the size/time of Earth**

Prof. Ivan Plander: Quo vadis, počítače a informatika, Oct 2008

The Third Wave

- **Alwin TOFFLER**

- **agricultural wave**
- **industrial civilization and thinking**
- **postindustrial wave, information society**

Alternative Culture

- **William GIBSON: Neuromancer or Johny Mnemonic - CYBERSPACE**

- **Douglas ADAMS: Hitchhiker´s Guide to Galaxy (Babel fish, 42)**

- **Matrix dystopy and Murphy´s Laws**

Internet before Computers

- **IDEA,**
- **METHODOLOGY,**
- **TECHNOLOGY (Hyper-G example)**
- **_____**
- **Computer in 19th Century: Ch. Babbage**
- **Sofware Idea: Ada Lovelace**
- **Internet Idea - smoke and mirror signals, bird postman**

Cyberspace

"Cyberspace. A consensual hallucination experienced daily by billions of legitimate operators, in every nation, by children being taught mathematical concepts… A graphic representation of data abstracted from the banks of every computer in the human system. Unthinkable complexity. Lines of light ranged in the nonspace of the mind, clusters and constellations of data. Like city lights, receding."

Gibson, W. 1984. Neuromancer. London 1984. (CZ)

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VR Prehistory

- **Neuromancer/Johny Mnemonic novel/movie by W. Gibson … (Matrix like dystopy), cyberpunk, CYBERSPACE… <u>immersion</u>**

- **Ivan Sutherland, Sketchpad, (1965) ,The Ultimate Display paper, stereoskopic images 1968, prof. Brooks, ... <u>VR hardware and software</u>**

- **Golem, humanoid, ROBOT, Metaversum… <u>avatar, virtual population</u>**

Early Use of CG Methods

- Algorithm Animation by Euclid
- Font Design in 9th Century
- Virtual Reality in 17th Century
- Voice Synthesis and Humanoid for Maria Theresia
- Robot in 30s ...

Algorithm Animation by Euclid

- Algorithm Animation
- Marc Brown - book
- David Dobkin - survey

Font Design in 9th Century

- **HLAHOLICA FONT DESIGN –**

- the oldest Slavonic alphabet was created by **St. Cyrilius/Constantinus** before **863**. He is thus the first known font designer in world history. Hlaholica celebrates its **1145th anniversary** in 2008. Unfortunately, we do not know neither the exact date nor the hour of the release.
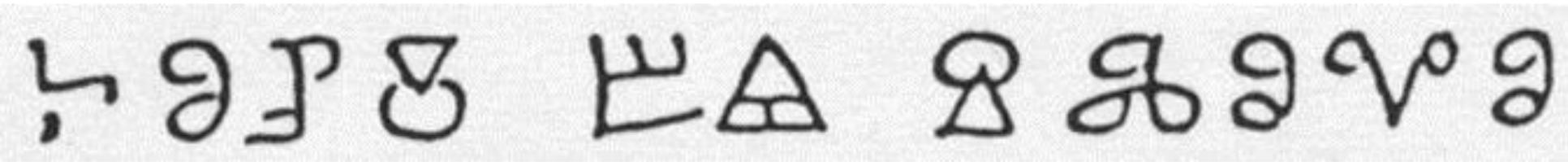
NA POČIATKU BOLO SLOVO ... ISKONI BĚ SLOVO

Virtual Reality in 17th Century

- **VISIBILITY HINT –** the Osman/Turkish expansion finish started in the Battle at Vienna in 1683. The giant Turkish army headed by Kara Mustafa approached the city of Vienna. The only help came with **Polish King Jan III. Sobiesky** and his soldiers. Jan Sobiesky had confused Kara Mustafa using the following (in)visibility procedure. One – nontrivial - part of Polish army marched all the day around the same hill. The Osmans counted the number of soldiers counting the same people multiple times. The final number in this virtual reality show was so high that Kara Mustafa decided to escape...
- Perfect immersion
- Low interactivity
- Good display devices, scaling factor...

Robot in the R. U. R. novel

- Czech fiction writer Karel Capek
- Slovak word near T. Teplice spa
- How to translate?
- Let it be...
- Etc.

Voice Synthesis & Humanoid for Maria Theresia

- **HUMAN VOICE SYNTHESIS –**
- **Wolfgang KEMPELEN (1734 – 1804)** became famous by constructing of robotised authomatic chess player in the size of human figure. Moreover, he invented the typewriter for blind people and output device, imitating the human voice system. The working voice generator prototype by Kempelen can be admired at the Museum of Computers in Boston. The house where W. Kempelen was born was not included to any museum – it is in Bratislava at Dunajska street.

ARTIFICIAL REALITY: Myron KRUEGER

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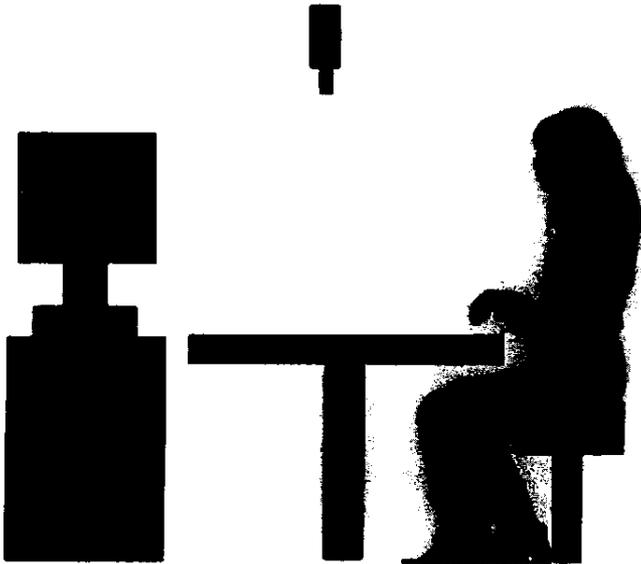
AR by Myron Krueger

- Interaction of participants… collaboration
- Interaction with the "world
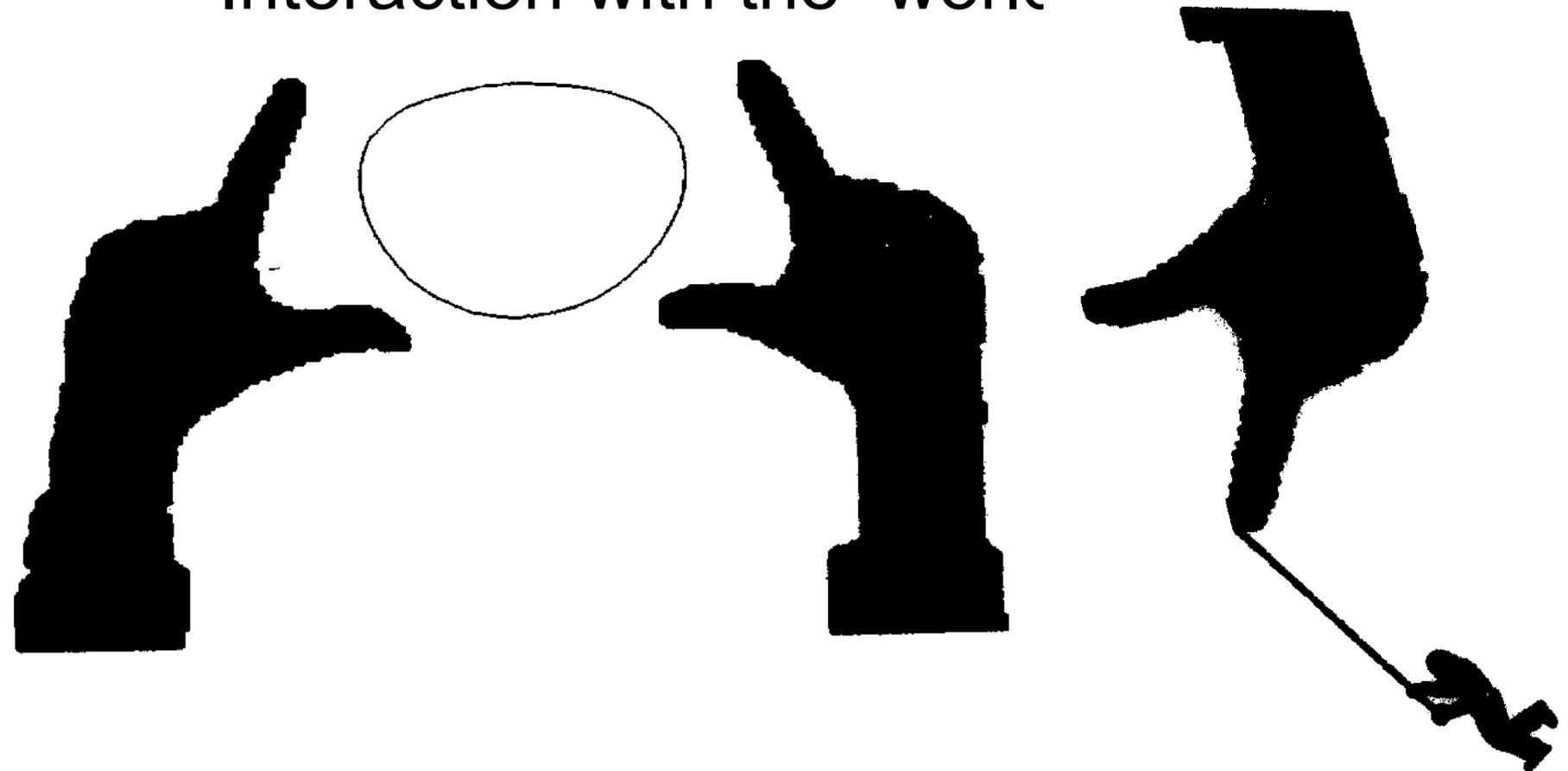
ARTIFICIAL REALITY plane & statue
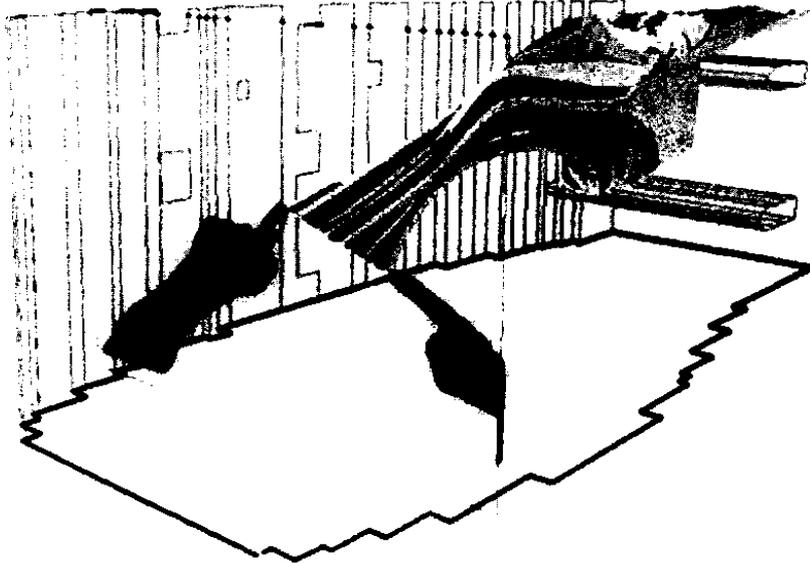
VIRTUAL REALITY: Jaron LANIER

- NASA, dataglove, HMD...

- 3D "world" interaction

- Rename of Krueger's AR

VRML 3D Sound

- Sound source: any sound file (MIDI, MP3)

- Sound model: two ellipsoids

MIN

MAX

ZERO
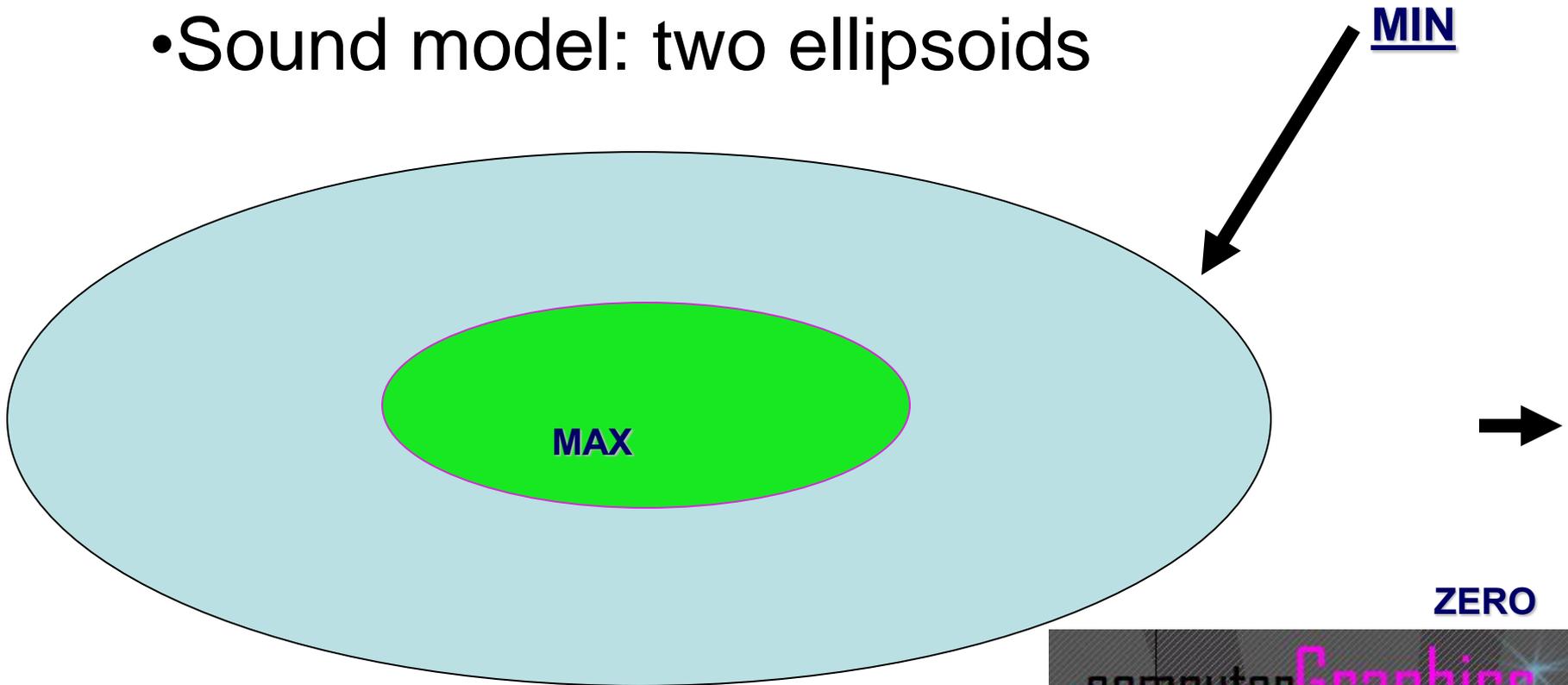
The VRML Sound Node

- **The syntax of the Sound Node:**

- **Sound {**
- **exposedField   SFVec3f   direction   0 0 1**
- **exposedField   SFFloat   intensity   1**
- **exposedField   SFVec3f   location   0 0 0**
- **exposedField   SFFloat   maxBack   1**
- **exposedField   SFFloat   maxFront   1**
- **exposedField   SFFloat   minBack   1**
- **exposedField   SFFloat   minFront   1**
- **exposedField   SFFloat   priority   0**
- **exposedField   SFNode   source   NULL**
- **field   SFBool   spatialize   TRUE**

- **}**

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User Interaction Model and Development

- Prompt, measure, trigger, input data record, echo, acknowledgement, processing, prompt...
- Request, sample and event mode
- 6-7 logical input devices
- GUI: 1D, 2D (WIMP), 3D (noimmersive and immersive solutions)
- menu-choice tree (acc.) or hypertext
- http://mrl.nyu.edu/~perlin/facedemo/

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Authoring Tools Menu

- **Procedural Techniques:** fractals, L-systems, particles, cellular automata, ...
- **Programming Languages: C++, JavaScript, Java, Java3D, Perl, PHP, ASP.NET ...**
- **Interactive Tools:** Maya, Rhino, trueSpace, 3D Studio Max, Flash, Teddy applet…
- **Technology Highlights: AMAYA**
- **Technology Highlights: Web3D Consortium Tools**
- **Interpreters: Maya MEL script, trueSpace scripts...**
- **Others: Mathematica, Radiance, POV-Ray…**
- **Too Expensive Tools:** AVS, Data Explorer, AutoCAD, RenderMan, Organica...
- **Free Tools:** VolVis, HyperFun, Fractint, applets by J. Stugel, MAYA, AMAYA, ...

- **It depends…**

- **… and: first of all: What to tell? Idea, name, logo, synopsis, treatment, storyboard, object definition, , keyframe generation, inbetweens, postprocessing...**

Authoring Tools Menu

- Procedural Techniques: fractals, L-systems, particles, cellular automata, ...
- Programming Languages: C++, JavaScript, Java, Java3D, Perl, PHP, ASP.NET ...
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- Too Expensive Tools: AVS, Data Explorer, AutoCAD, RenderMan, Organica...
- Free Tools: VolVis, HyperFun, Fractint, applets by J. Stugel, MAYA, AMAYA, ...

- **It depends…**

- **… and: first of all: <u>What to tell?</u> Idea, name, logo, synopsis, treatment, storyboard layout, object definitions, keyframe specification, inbetweens, interaction, postprocessing, promotion, distribution…**
The end.

Cel Animation

- Idea, name, logo, storyboard etc.
- transparencies by Glassner
- Walt Disney, Hanna-Barbera
- Mickey Mouse, Donald Duck, Popeye the Sailor, Tom & Jerry
- 3D case is 4D, 5D with HyperFun

Popular Audio Example

- Ladovska zima – a song by J. Nohavica

- A hit in a few days at CZ/SK web

Sound Spaces Motivation

- **Why Sound within Computer Graphics?**
- **Sound vs. Image**
- **Human Understanding Sounds**
- **An Example - Data Sonification**
- **Sound Spaces Construction**
- **Sounds On-line and Authoring Tools**

Why Sound within CG ?

- **Historical Reasons: BELL, ASCII 7**
- **GUI: eye, ear, other senses**
- **Visually Impaired & Blind People**
  - **Braille line instead of display...**
    HUMANISATION of IT

- **Motivation: What sound can do?**

Sound vs. Image

- Sound is temporal, image is static
- Good eyes: hawk: predators, good ears: bunny
- Sound from parent layer, image from child one
- Digital sound and analogue one
- Music understanding differs with culture
- Curve and melody… tones and colors...

Sound Uses

- more information
- extending the scene
- emotional content
- real sounds from model and reality
- visually impaired or poor display
- sound as iconic, indexed, symbolic representation of meaning, plus signal,
- using speech, music and non-speech audio cues (beeps, noises)

The Graphics Pipeline Steps

input devices → modeler

Modeling

transformations

projection

clipping → visibility

Rendering

shading

rasterization

Output

device drivers → output devices
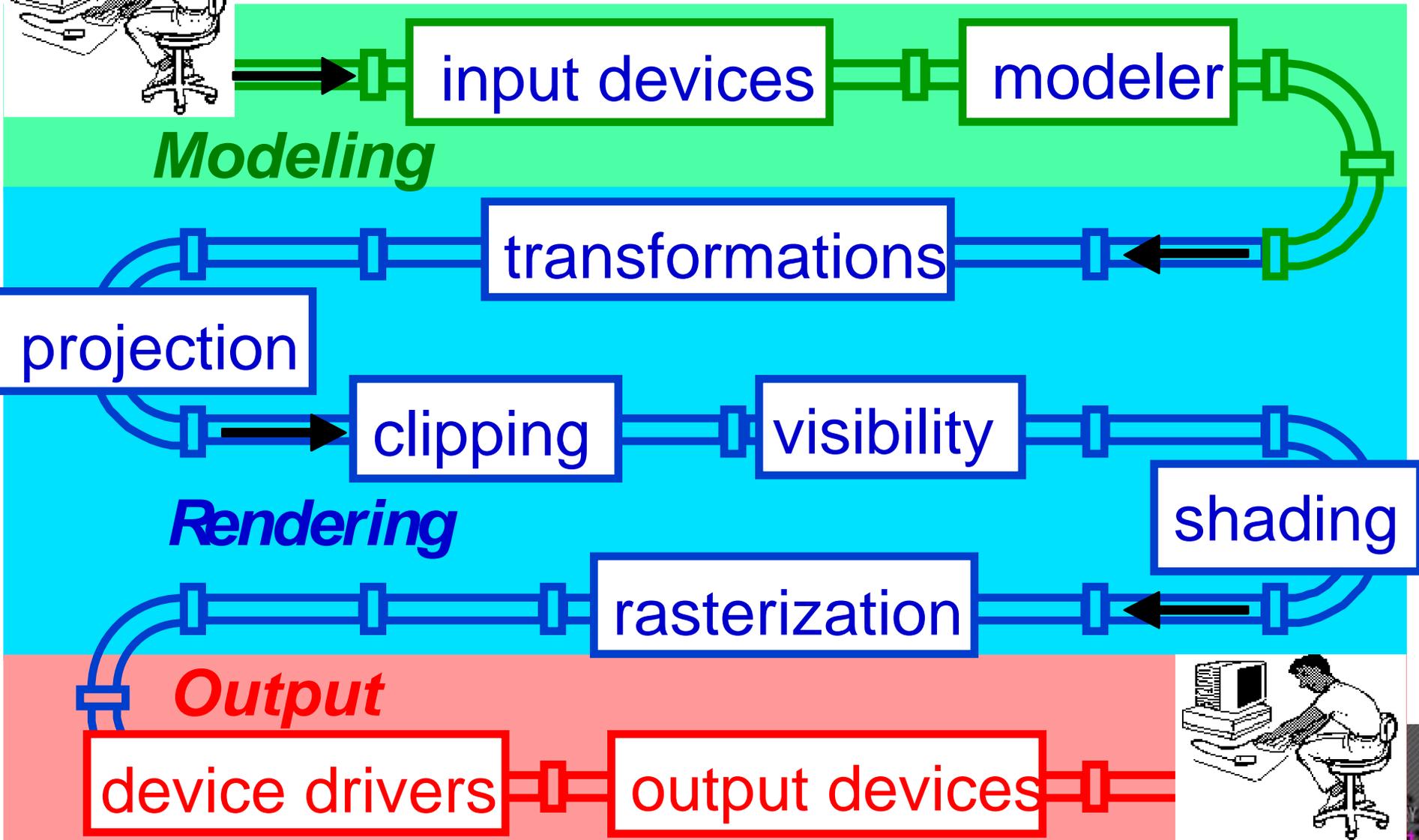
The Sound Rendering Steps

Modeling

input devices → modeler

Rendering

A/D   (1D)

requantization

filtering → compress

segmentation

(recognition)

Output

device drivers → output devices
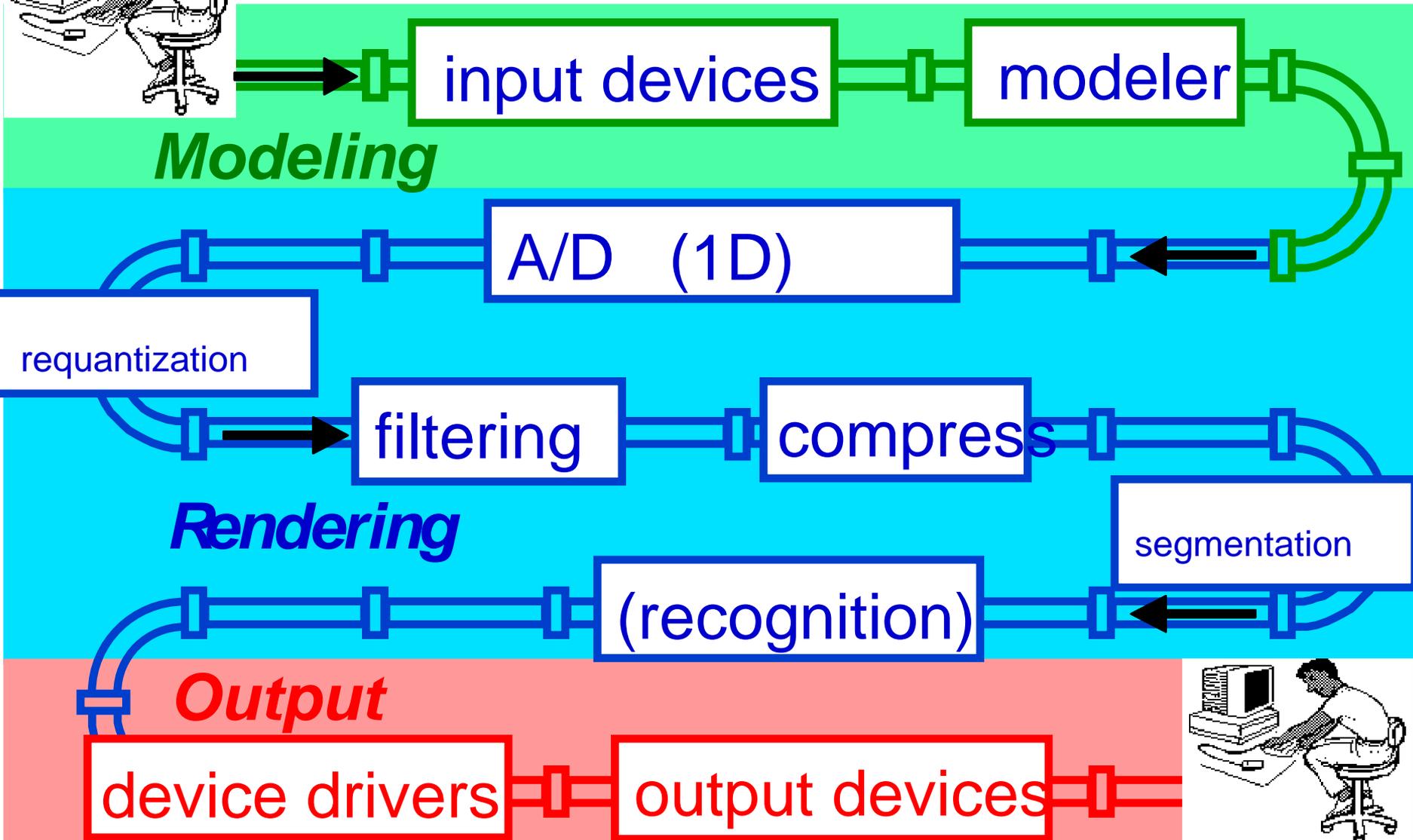
Examples by P. Bourke

- **White noise, quite black**
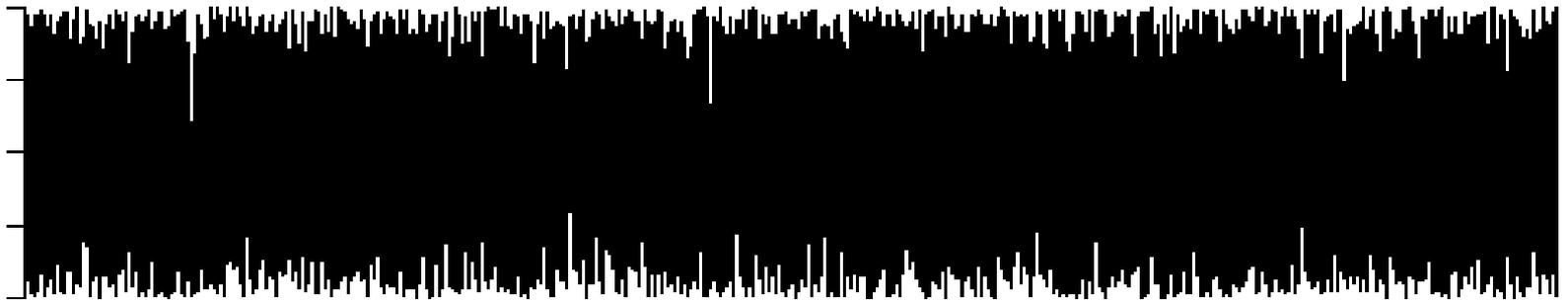
Many tools for each phase

- Sound processing tools:
- Transformations, D/A, A/D conversions
- Fourier transform, convolution, filters
- Wavelet transform
- Compression, databases, archives, MP3...

Architecture of Multimedia System

- **A. Data bus for structured pictures**
- **B. Data bus for unstructured images**
- **C. Data bus for structured sounds**
- **D. Data bus for unstructured, natural sounds**

- **Input for A & C: model, data and functionality**
- **Input for B & D: scanner and microphone**

[Stuc91] STUCKI, P.: Graphics and Multimedia, tutorial at Eurographics Conference, Vienna 1991

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Architecture of Multimedia System

- **A.** Data bus for **structured pictures VRML, CGM, SVG**
- **B.** Data bus for **unstructured images JPG, GIF, PNG**
- **C.** Data bus for **structured sounds MIDI**
- **D.** Data bus for **unstructured, natural sounds MP3**

- **Input for A & C: model, data and functionality**
- **Input for B & D: scanner and microphone**

- [Stuc91] STUCKI, P.: Graphics and Multimedia, tutorial at Eurographics Conference, Vienna 1991

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Architecture of MM System II

- **A to B functional unit is Computer Graphics.**
- **B to A functional unit is Image Analysis.**
- **C to D functional unit is Sound Synthesis.**
- **D to C functional unit is Sound Analysis.**

- **No model cases:**
- **B to B is Image Processing: image to image.**
- **D to D is Sound Processing: sound to sound.**

- [Stuc91] STUCKI, P.: Graphics and Multimedia, tutorial at Eurographics Conference, Vienna 1991

Sonification

- **B to D images to sounds**
- **D to B sounds to images**

- **If we resign on error/model, we can use**
- **any of the functional units for VISUALIZATION or SONIFICATION**

- **Their goal is to enhance UNDERSTANDING.**

Areas of Information Processing

input \ output	description	image	sound	smell	taste	touch
description	Symbolic manipulation	Computer graphics	Sound synthesis	Smell synthesis	Taste synthesis	Touch synthesis
image	Image recognition	Image processing	Sonification			
sound	Sound recognition		Sound processing			
smell	Smell recognition			Smell processing		
taste	Taste recognition				Taste processing	
touch	Touch recognition					Touch processing

Slide by Stano Stanek

Four General Criteria

- **ISO/IEC JTC1 Strategic Policy Statement formulated in 1994 the   strategic objective as   follows: to promote world-wide economies and efficiencies and global trade by creating an international standards environment that will enable IT suppliers to provide IT users with timely means to manage information efficiently, economically, accurately and securely. The strategic   criteria give four "external" limitations to each medium: from efficiency to security.**

Directing the ear trajectory

- The simplest case: radio
- The page is presented as a 1D sound stream
- Listening to the read document

- Directing of listening, index, links,
- search, rewind, repeat...

Sound Spaces

- GUI, application
- sound source tree
- attributes: volume, stereo field, frequency, rhythm, timbre...
- 2D or 3D grid sonification
- WIMP sonified (T. Fora), earcon
- keyboard modes: description, operating

Scientific Sonification

- **DNA listening tool**
- **volume rendering surface properties: normals, curvatures, gradient sign, etc.**
- **KYMA language & SIGGRAPH CN**
- **pendulum example, ...**

Defining Animation

- ISO: Animation: image sequence ordered in time for video display. This covers all changes which cause visual effect (position, shape, color, transparency, object structure and texture, lighting, camera parameters, even the rendering technique).

- Anima - spirit, soul, life...

Animation (www.siggraph.org)

- **Introduction**
- **Types of Animation Control Systems**
- **Low level Motion Control**
- **Camera Animation**
- **Character Animation**
- **Particle Systems**
- **Artificial Life**
- **Post - Production in Computer Animation**

Walt Disney's Principles

- In the 1930's... principles were developed to make animation, especially character animation, more realistic and entertaining... can & should be applied to 3D computer animation…

- **1. Squash and Stretch** - defining the rigidity & mass of an object by distorting its shape during an action

- **2. Timing and Motion** - spacing actions to define the weight and size of objects and the personality of characters

- **3. Anticipation** - the preparation for an action

- **4. Staging** - presenting an idea so that it is unmistakably clear

- **5. Follow Through and Overlapping Action** - the termination of an action and establishing its relationship to the next action

- **6. Straight Ahead Action and Pose-to-Pose Action** - The two contrasting approaches to the creation of movement

- **7. Slow In and Out** - the spacing of the in-between frames to achieve subtlety of timing and movement

- **8. Arcs** - the visual path of action for natural movement

- **9. Exaggeration** - Accentuating the essence of an idea via the design and the action

- **10. Secondary Action** - the action of an object resulting from another action

- **11. Appeal** - creating a design or an action that the audience enjoys watching

  - **=> Personality** in character animation is the goal of all of the above.

Tricks to Animating Characters
by John Lasetter

- **Keyframes**
- **2D vs. 3D**
- **Weight & Size**
- **The Thinking Character**
- **Moving Holds**
- **Emotion**
- **Readability of Actions**
- **A Story Trick**
- **Ask Why**
- **Animation Notes from Ollie Johnston**

Facial Expressions

- Geri's Game
- subdivision surfaces
- sound space construction

Algorithm Animation

- **Book by M. Brown**
- **Historical survey by Hausner&Dobkin**
- **Algorithm: static-written, dynamic-runtime, default values, initialisation, profiling, history of each variable, ...**
- **Multiple views: global & local zoom, visual output, ...**
- **Speed: step by step, normal run**
- **Prepared input data for demos**
- **Error behavior, interactivity**
- **Automatic algorithm animation, input: C code, output: animation**

Animation On-Line 1

E-book: WWW Animation Book

http://www.cis.ohio-
state.edu/~parent/book/outline.html

Entertainment and New Media Guide (Careers)

http://www.skillsnet.net/core.cfm

Animation On-Line 2

SIGGRAPH Animation Course:

http://www.siggraph.org/education/materials/HyperGraph/animation/anim0.htm

SIGGRAPH Course Notes:

- http://www.siggraph.org/education/materials/siggraph_courses/s96_course30.pdf
- http://www.siggraph.org/education/materials/HyperGraph/animation/character_animation/principles/prin_trad_anim.htm
- http://www.siggraph.org/education/materials/HyperGraph/animation/character_animation/principles/lasseter_s94.htm
- http://www.siggraph.org/education/materials/HyperGraph/animation/character_animation/motion_capture/motion.htm

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Oxymorons

Scientific Visualization

Animation

- **"There is no particular mystery in animation… it's really very simple, and like anything that is simple, it is about the hardest thing in the world to do."**
  - **Bill Tytla at the Walt Disney Studio, June 28, 1937.**

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VR Notions Survey

- Artificial -> Virtual Reality, Virtual Environment, Synthetic World, Cyberspace (all contradicions)
- Augmented Reality, Mixed Reality
- Key Words
  - Immersion
  - Interaction and Navigation, Avatar
  - Real-time
    - **System Answer Time: less than 0.1 s**
    - **Visualisation: at least 10 images/s**

Questionable Definitions

- **CG textbook by Salomon:**
  - **Model and display of real object**
  - **Animation**
  - **VR = <u>Interacting with 3D animation</u>**

- **Another VR definition:**
  - **Interactive computer system, creating illusion of 3D space**

Standard Definitions

- John VINCE in Essential VR Fast:
- **Systems that create a real time visual/audio/haptic experience**

- VRML Standard definition

VR Prehistory

- **Neuromancer/Johny Mnemonic novel/movie by W. Gibson … (Matrix like dystopy), cyberpunk, CYBERSPACE… <u>immersion</u>**

- **Ivan Sutherland, author of Sketchpad, (1965) The Ultimate Display paper, stereoskopic images 1968, prof. Brooks, ... <u>VR hardware and software</u>**

- **Golem, humanoid, ROBOT… <u>avatar</u>**

Designing Objects+Places in 3D

- By Bonnie Mitchell

- VRML - Design in 3D
- Realism
- Abstraction and Stylization
- Balance
- Spaces to Explore
- Innovation in Space

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VRML - Design in 3D contd.

- By Bonnie Mitchell

- reveal more information as the viewer navigates the space

- all views are fair game

- AF: model as DB or sea of images IBR

- AF: 4 modes = walk, fly, jump, repeat

- a still image placed on an HTML page

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Virtual Population

- **Colony of virtual ants – Prado Museum**

Philosophy…

- **Virtual habitat = v-space + v-population**
- **Positivistic understanding**
- **Dualistic understanding**

Defining Population

- **Virtual habitat = v-space + v-population**
- **Population – living and dead things**
- **Bot, autonomous agent, avatar**
- **Autonomous agent has IQ (AI)**
- **Avatar represents a user (youser)**

Matrix: dystopy

- **Thomas Morus: Utopia**
- **Leonid Zamjatin: We (Russian)**
- **George Orwell: 1984, Animal farm**
- **The Brave New World**

- **Watching people, using lie, changing or erasing memory (Big Brother)**
- **Matrix has nothing new, except immersion**

Human memory system [SHN97]

<u>Short-term memory capacity:</u>

- **"The magical number seven - plus or minus two" (G. Miller, 1956) recognize seven "chunks" of information hold for 15 to 30 seconds forget or move to long-term memory**

- http://www.uni-paderborn.de/fachbereich/AG/agdomik/visualisierung/vis-report/tutorial/chapter3/tsld012.htm

Human memory system 2

- **Short-term memory in conjunction with working memory**

- **short term memory:** process perceptual input
- **working memory:** generate and implement solutions

- disruptions, anxiety cause loss of information

- http://www.uni-paderborn.de/fachbereich/AG/agdomik/visualisierung/vis-report/tutorial/chapter3/tsld012.htm

Metaphors of memory

- **Drouwe Draismaa in Czech translation**
- **Wax table, theater, photo, computer...**
- **Beahviorists**
- **Connectionists**

- **Hologram, neural networks**

Human Visual System

- **Self-defense and Survival:**
  - **(sound, fast brain/amygdala)**
  - **1. <u>motion !!!</u>**
  - **2. shape (the longest vertical one first)**
  - **3. color, texture, „structure"**
  - **4. symbols recognition**
  - **5. meaning .. ambiguity .. more**

"Invisible Color"

- **Self-defense and Survival:**
  - **(sound, fast brain/amygdala)**
  - **1. <u>motion !!!</u>**
  - **2. shape (the longest vertical one first)**
  - **3. color, texture, „structure"**
  - **4. symbols recognition**
  - **5. meaning .. ambiguity .. more**

Virtual Interaction (Qvortrup)

- Virtual habitat = v-space + v-population
- How does one navigate in an with a virtual inhabited 3D world?
- How can the virtual world and the interface be the part of the same world?
- How can the use of these interfaces be supported by implicit narrative structures?
- How can the autonomous agents function as assistants to the end-user?
- How can the WYSIWIG be replaced by What you want is what you get?

Film Directing/1 Staging

- Film 5 channels – visual image, print and other graphics, speech, music, sound effects

- Mise-en-scene modifies space, montage modifies time

- Kuleshow effect – neutral face

- Mise-en-scene, staging an action, originally directing theatre plays - setting, lighting, figures, movement, appearance and costumes

- Goal – guide our attention across the scene, what we look at and when

- Overlapping planes, linear perspective, density gradients, relative size, height, aerial and vanishing perspectives, light, shadows, CG effects, p. 320

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Film Directing/2 Cinematography

- Writing in the light
- Techniques of shot, p. 320, HOW the staged content/WHAT is being filmed
- Camera angles
- Depth characteristics of lens
- Pan, tilt, roll, zoom, tracking/dolly shot, crane shot, POV shot
- First person shot, subjective camera, 6 degrees of freedom with avatar
- Output is shot

Film Directing/3 Montage

- Relating shot-to-shot, putting together, p. 324
- Kuleshov effect
- Cut
- Double exposure, dissolve, fade in/out, iris in/out, circle in/out, wipe, swish pan, whip shot… Glassner CG&A 2003
- Editing is one of the most annoying aspects of WWW
- Interaction of qualities – graphic, rhythmic, spatial, temporal... Invisible cutting with seamless transitions

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Film Directing/4 Sound

- Sound can point to things of particular interest, p. 327
- Speech, music, sound effects, and silence 4
- Non-diegetic sound cannot be located in the scene, space, world, typically sound over, voice over
- Diegetic sound – actual sound, subjective sound, the voice of the narrator * on-screen/off-screen * synchronous/asynchronous
- Sound perspective
- Counterpoint versus parallelism
- There can be more than one sound
- Geri's Game signs, codes, meaning

This Week Review

- Contact classes at SSST Sarajevo – 1 week
-
- Day 1 Story day
- Day 2 Digital storytelling day
- Day 3 Computer games day
- Day 4 Virtual interaction and cooperation day
- Day 5 Interactive storytelling day

Day 1 Story day

- Hour 1 Motivation, course organisation, fundamental notions, Inscape videos and tool
- Hour 2 Storytelling, history, genres, theories, multimedia production pipeline
- Hour 3 Student presentations
- Hour 4 Discussing ideas, homework assignment on pitching preparation
- Hour 5 **Guest lecture** by Dr. Selma Rizvic on sketching for storyboard
- Hour 6 Sketching exercises with Dr. Selma Rizvic
- Hour 7 Computer animation workflow by Walt Disney et al.
- Hour 8 Inscape authoring tool – non-interactive linear stories, examples, questions

Day 2 Digital storytelling day

-

- Hour 1 Timeline, script, premise and plot, actors, story planning, character sheets

- Hour 2 Story basic elements and structure, situations, shots

- Hour 3 Homework stories pitching and discussing

- Hour 4 Digital storytelling history, milestones, and techniques

- Hour 5 **Guest lecture** by an expert from ASU Sarajevo on Drama and Acting

- Hour 6 Drama and Acting exercises with an expert from ASU Sarajevo

- Hour 7 Review of scripts from Drama and Acting point of view

- Hour 8 Inscape authoring tool – interactive, non-linear stories, examples, questions

Day 3 Computer games day

-

- Hour 1 Comparing stories and games, computer games history, milestones, techniques

- Hour 2 Computer game design sequence, goal, topic, structure of game and program

- Hour 3 Rules and scoring, game design techniques and ideals

- Hour 4 Merging stories and games, branching structures

- Hour 5 **Guest lecture** by an expert from ASU Sarajevo on Film Directing

- Hour 6 Film Directing exercises with an expert from ASU Sarajevo

- Hour 7 Directing digital stories and computer games

- Hour 8 Inscape authoring tool – 3D computer animation

Day 4 Virtual interaction and cooperation day

- Hour 1 Virtual space, interaction, and cooperation, autonomous agents and avatars
- Hour 2 Special modeling techniques: celullar automata, particle systems, mass scenes
- Hour 3 Designing interaction, navigation, and cooperation
- Hour 4 Digital storytelling, semantic web, and digital libraries
- Hour 5 Sound spaces and sound processing methods and tools, listening to Geri's Game
- Hour 6 Social computing environments, online communities, human & cultural factors
- Hour 7 Practical work and individual consultations
- Hour 8 Discussing selected issues from particular projects

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Day 5 Interactive storytelling day

-
- Hour 1 Environmental, data-driven, and language based strategies
- Hour 2 Personality models and drama managers, artificial intelligence
- Hour 3 Story environments and participation
- Hour 4 Technical feasibility assesment
- Hour 5 Digital storytelling in cultural heritage
- Hour 6 Progress reports on student projects
- Hour 7 Final discussion of achieved results
- Hour 8 Perspectives of digital storytelling and closing remarks

Introduction & Motivation

- **Introduction & Motivation**

- Storytelling is the oldest method of sharing human experience and a story is the very first format for symbolic information used in oral tradition and printed books. Historically, there are three kinds of stories only – myth, fairy tale, and science fiction (SF). Myth describes the past only. Fairy tale introduced the past and the present time. SF communicates all three tenses – past, present, and future ones. The best understood storytelling is with fairy tales, where we have the morphology. In morphology of fairy tales, the basic situations (building blocks) are given by so-called Propp functions. You need a few simple characters (like hero, villain, princess) and use the functions to make a really good fairy tale. For example, all James Bond stories are written this safe way.

Using two Propp functions

- *Example 1 – Using two Propp functions: 1. A hero (Bond, Shrek, Superman) is introduced to some spell in a form of a new weapon. Here you need hero, good helper (old lady, written message, or speaking animal) and the knowledge. At the end of this scene you know what hero knows, which makes you well identified with him. Bond is armed with a suprising weapon, Shrek knows from the Donkey that Fiona loves him and Superman is superinformed – with You. You know more!!!*

- *2. Knowing more, you are better informed about what can be expected. Hero can use the weapon against the villain. Your wonderful expectation is based on sharing the secret with the hero. You think his way! Therefore, when the weapon is used, you share the success and joy with the hero.*

-

- *You are engaged, persuaded, and your expectation has been satisfied.*

Theoretical explanation

- Theoretical explanation of the last simple line of the example can be given in three complex ways: by recent theory of appraisal (engagement), ancient theory of rhetoric (persuasion), and standard psychology of perception (expectation).   In the following we will not deal with deep theories, just try to think about storytelling in a practical way – how to create a good digital story.

- There are probably as many definitions of story as there are people to define it, says Andrew Glassner in Interacitve Sotrytelling (2004, p. 36). His definition: **A story follows an interesting protagonist seeking a clear goal by addressing an ever-escalating set of difficulties.**

- The final evaluation of your story can be easily measured by the feedback from your audience (target group). E. g. in virtual museums the engagement is measured by the total number of visitors, divided by number of repeated visits, and multiplied by the average time spent at your webpage.

Mamma mia Example

- There are much more complex tasks far beyond the 29 given Propp situations (scenes). In the year 2008, probably the most complex storytelling problem was solved in the musical comedy Mamma mia. How the story of Mamma mia (2008) was created? There are many songs from ABBA, some of them superhits. Several supertophits had to be included into the story. Another ones were selected because their lyrics described the suitable scenes. Having these scenes, given by songs, the author interpolated them with story and characters, which were not that simple like hero or villain. Musical comedy requires dancing and dancing is a group activity. Which groups are there? Old women, old men, young women, young men (four groups varying from 3 to many members. Now only you can solve the hard problem for Mamma mia – write individual scenes (one voice), dialogues (more than one voice), group scenes (voices, dances) and mix them that way that along the storyline the individual and group scenes change. Having, say, seven individual scenes followed by seven group scenes is wrong for musical comedy. The idea with three possible fathers, which gives the problem to be solved, is not contained in ABBA songs. It is borrowed from comedy writing rules. All ABBA songs were reduced to 15 of them, added characters, groups, conflict, sujet, fabula, plot, non-song scenes, dialogues… Bad news is that there are no safe rules for creating Mamma mia type story. Good news is that in digital storytelling we deal with much easier problems.

Places of Uncertainty

- We need to know our message (theme) first, name, logo, subtitle, genre, synopsis, treatment, storyboard… These are so-called zero-level mediation degrees [Stan88]. In other words, there is no storyteller with them. They are just levels of the future message and each of them is not mandatory. When telling a joke, usually, we do not give the title, subtitle, logo… In other words, there are places of uncertainty [Stan88] in name of story, theme, subtitle, name of chapter, synopsis… Synopsis gives only a survey of the story in a similar way like when telling your friend what was the movie about. There are synoptic chapter titles in older books – the complete title of Robinson Crusoe is maybe the most famous example, having about 20 lines. The places of uncertainty are parts of the story, which are NOT told.

Four Parts

- When a computer scientist or a programmer analyzes a story, there are the following 4 parts [Gogu08]:

- An optional orientation section (name, time, place, characters…)

- The main body of the narrative, describing events in a sequence.

- The evaluative material (interpretative or evaluative information)

- An optional closing section, which summarizes the story, or perhaps gives a moral.

The shortest fairy tale

- **Example 2 – The shortest fairy tale:** *A. "Once upon the time there was the end."*
- *Here some of the above parts are clearly missing. This is the orientation section only.*
- *B. "In Sarajevo, the future Austrohungarian Emperor was asassinated."*
- *Here just one event is briefly communicated and we may guess if this belongs to part 1 or 2 or 3. The evaluation part is missing for sure.*
- *C. "James Bond obtained a new weapon and he killed the villain."*
-
- *The examples A, B, and C have zero, one and two events. Except for A, the evaluation part is PRESENT, but not told. The murder is bad, but saving the world by killing the villain can be acceptable for the audience. This evaluation belongs to a system of values.*

1. The lesson learned

- We can discuss this in more detail… 1. The lesson learned would be that the story consists of events, happening in time, and a system of values, which is static during the story, but helps to evaluate the story within a given community. The Sarajevo asassination story was evaluated differently in rich and powerfull Vienna and in a small wooden Slavonic or Romanian village, where poor people suffered from incredible opression, including the torturing of pupils for speaking their native language. The same story was evaluated in two systems of values as very wrong disaster or as sort of good revenge.

2. replace description by imagination

- 2. The C example is told in a poor way for 2. as the description is not concrete. The main body of narrative is the only one which can replace description by imagination and cause emotions and HM…, AH, AHA and HAHA reactions. New weapon and killing have to be presented in much better audiovisual quality.

3. The zero mediation parts

- 3. The zero mediation parts 1. and 4. do not require a storyteller, but especially part 2. requires a storyteller. Probably the most complex storytelling can be found in My Name is Red by Turkish Nobelpricewinner (2006) Orhan Pamuk, where pieces of the story are told by tens of storytellers, including the dead man and even the red color. Yes, red color can be a storyteller. This clearly demonstrates, that the author and the storyteller are DIFFERENT roles. Yes, one of your authoring decisions includes the voice(s) of storyteller(s).

- We can discuss this in more detail… later (as voice is a simple indication of modus, person, and perspective [Stan88]).

4. Parts 1., 3. and 4. even absent

- 4. Parts 1., 3. and 4. can be even absent in extremal cases like Waiting for Godot by Samuel Beckett (an absurd drama) or Hills Like White Elephants, which is a famous short story in 5 pages by Ernest Hemingway. In both cases you can guess only the time, space, character biographies and/or motivations. Exactly this happens when you listen to a fragment of a dialogue. Missing information (places of uncertainty) can be partially completed by audience. Part 3. is sometimes named sujet or theme and it is understood as an opposite to part 2 named fabula.

5. All story parts… perception

- 5. All story parts can be seen not only in a fiction. For a scientific paper, part 1 includes title, abstract, keywords. Part 2 (time dependent) recalls previous work and surveys the ideas from other authors. Part 3 offers the evaluation of new ideas and results, experiments, methodology, discussion. Part 4 concludes the paper. If there are mentioned open problems or future work one can classify this either as continuation of time dependent story part or another aspect of evaluation. In contrary, drama or movie offers only part 2 and very rarely there are voiceovers or texts belonging to another story parts.

- 6. Story perception…

Compromise in Authoring

- Three Steps and the Seven Elements of Digital Storytelling…

- 50 Web 2.0 Ways To Tell a Story

- http://cogdogroo.wikispaces.com/50+Ways

- **This solution will be not evaluated with 100%**

- More Web 2.0 resources
- http://digitalstorytelling.coe.uh.edu/expand.html
- Notes on Narrative by Joseph Goguen
- http://www-cse.ucsd.edu/users/goguen/courses/275f00/narr.html

Conclusions

- Short time goal – contact classes, demoreel, story
- Long time goal – TTA competition, methodology

- **Thank You for Your time and attention**

- **Good luck!**

Directing and Storytelling

This core module will enable students to write, design, storyboard and direct an animated feature. The module will comprise of six main elements:

- Drawing
- Narrative
- Technical feasibility assessment
- Storyboarding
- Presentation
- Directing

Computer Graphics for the Media Industry (CGMI)

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