

## Introduction

Prof. Dr. Paul Müller

AG: Integrierte  
Kommunikationssysteme

ICSY

ICSY

## How to contact

Prof. Dr. Paul Müller  
34 / 312  
Tel.: 0631 / 205 - 2263  
e-mail: mueller@uni-kl.de

Bernd Reuther  
32 / 344  
Tel.: 0631 / 205 - 2161  
e-mail: reuther@informatik.uni-kl.de

Ye Yuan  
32 / 346  
Tel.: 0631 / 205 - 4173  
e-mail: yuan@informatik.uni-kl.de

ICSY

## Acknowledgements

Prof. Dr. Ralf Steinmetz, TU-Darmstadt  
Stephan G. Eick, Bell-Labs  
Dr. Andreas U. Mauthe, Fa. TecMath  
Dr. Peter Thomas, Fa. TecMath  
Prof. Dr. Hans Irtel, Uni Mannheim

Universität Kaiserslautern:  
Dipl. Inform. Bernd Reuther  
Dipl. Inform. Ye Yuan

ICSY

## Literatur

Guojun Lu  
Communication and Computing for Distributed  
Multimedia Systems, Artech House 1996

Ralf Steinmetz  
Multimedia-Technologie, Einführung und Grundlagen,  
Springer-Verlag, 1993

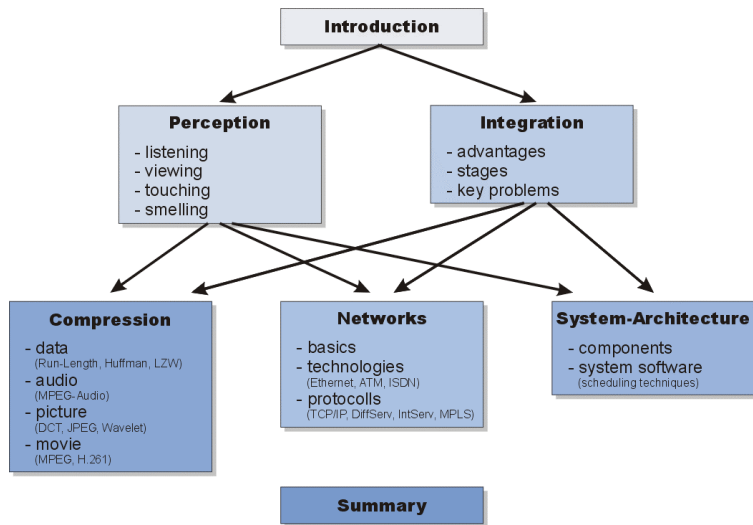
Borko Furht, Milan Milenkovic  
A Guided Tour of Multimedia Systems and Applications  
IEEE Computer Society Press, 1995

François Fluckinger  
Understanding Networked Multimedia, applications and  
technology, Prentice Hall, 1995

Andrew S. Tanenbaum  
Computer Networks, third edition  
Prentice Hall, 1994

ICSY

## Site Map



Copyright, 2000 © Universität Kaiserslautern, Fachbereich Informatik, AG ICSY

## 1. Introduction to Multimedia

### Opinions:

- "In our multimedia system you can not only edit text, but also include graphics."
- "While you edit your document you can have these five HDTV windows on your screen – oh, look, right now some voice mail came in.,,"

### Multimedia = Multi + media:

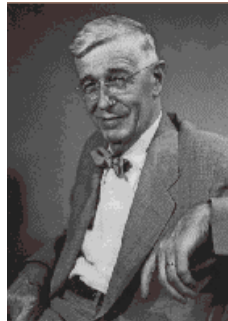
- Multi:
  - Many
- Medium:
  - "Thing in the middle"
  - Means to distribute and present information

Copyright, 2000 © Universität Kaiserslautern, Fachbereich Informatik, AG ICSY

## History of Multimedia 1

### 1945 Vannevar Bush

- Article in: „Atlantic Monthly“ about a system called „**Memex**“ (memory extension), Linkstructure between documents.
- Memex a future device for mechanized private file and library. A memex is a device in which an individual stores all his books, records, and communications, and which is mechanized so that it may be consulted with exceeding speed and flexibility. It is an enlarged intimate supplement to his memory.
- 1973 at Xerox Palo Alto Research Center (PARC) in California, Alan Kay, a disciple of Vannevar Bush, introduced the graphical user interface (GUI) on the world's first personal computer (Alto) connected to the first local area network (Ethernet).



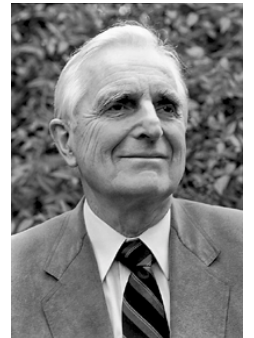
V. Bush original text

Copyright, 2000 © Universität Kaiserslautern, Fachbereich Informatik, AG ICSY

## History of Multimedia 2

### 1958 Doug Engelbart

- first began publishing in about future high-performance organizations, enabling collaborative technologies and practices for knowledge work, knowledge management, etc.
- 1963 Doug Engelbart invented the computer mouse.



Copyright, 2000 © Universität Kaiserslautern, Fachbereich Informatik, AG ICSY

## History of Multimedia 3

### 1968 Ted Nelson

- 1968 Einführung des Begriffes „Hypertext“
- 1980 Projekt XANADU (Literary Machines)
  - Hypertext is the presentation of information as a linked network of nodes which readers are free to navigate in a non-linear fashion. It allows for multiple authors, a blurring of the author and reader functions, extended works with diffuse boundaries, and multiple reading paths.



T. Nelson original text

## History of Multimedia 4

### 1989 Tim Berners-Lee

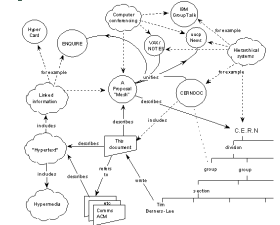
- Dokumentensystem **WWW** im CERN, Genf

### March 1994

- Marc Andreessen and colleagues leave NCSA to form "Mosaic Communications Corp" (now Netscape).

### May 25-27, 1994

- First International WWW Conference, CERN, Geneva. Heavily oversubscribed (800 apply, 400 allowed in): the "Woodstock of the Web". VRML is conceived here.



T. Berners-Lee original text

## Media

Media are means of communication:

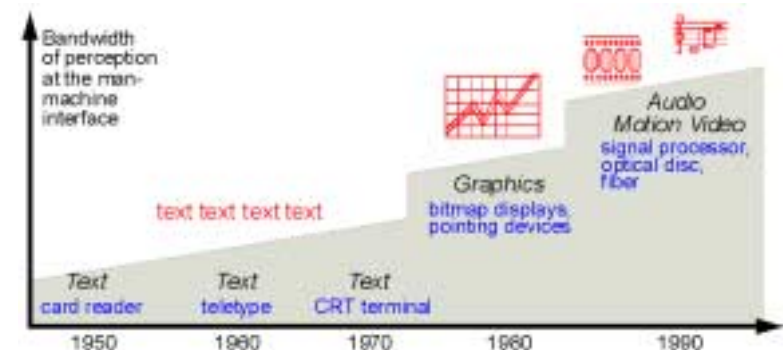
- Between computers and their users
- Between humans using computers as communication tools
- Between humans and the environment

Media in computing:

- Text:
  - 1950's: card readers
  - 1960's: teletypes
  - 1970's: CRT terminals
- Graphics (geometric and raster):
  - 1980's: bitmap displays, pointing devices
- Audio and video:
  - 1990's: digital signal processors, optical disks, fiber

## Media

Media affect human computer interaction:



- Listening is easier than reading
- Showing is easier than describing
- Speaking is faster than writing

## Why are Media Important?

### Media determine:

- For what purpose computers are used
- How computers are used
- Who can use computers

### Example: Visualization / Graphics

- New applications:
  - Geometric modeling, Computer-aided design, ...
  - Information Visualization
- New interfaces:
  - Windows, Icons, Desktop.

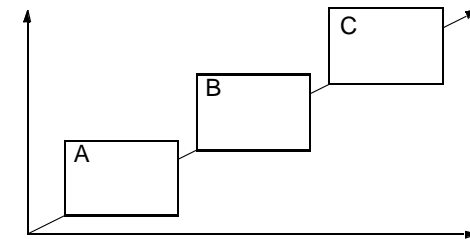
### Conclusion:

*Multimedia systems affect our view of computing in general, not just specific application areas.*

## Media Present Information

### Presentation dimensions:

- Value dimension (Dimension 0)
- Spatial dimension:
  - Computer screens: 2 visual dimensions
  - Holographic projectors: 3 visual dimensions
  - Stereo sound: 1 acoustic dimension
- Temporal dimension



## Time-Dependence of Media

### Time-independent media:

- Text
- Graphics
- Discrete media

### Time-dependent media:

- Audio
- Video
- Continuous media

Note: "**Continuous**" refers to the user's impression of the data, not necessarily to its internal representation.

## Media Present Information

### Media transport information appealing to human senses:

- Presentation space:
  - Sense of vision (paper or computer displays)
  - Sense of hearing (stereophonic sound)
  - Sense of touch/tactile (pressure gloves)
  - Sense of balance (pneumatic simulators)
  - Sense of smell, taste,...
- Presentation values:
  - Characters
  - Pressure waves

### Value classes:

- Self-contained values:
  - Temperature, taste, smell
- Agreed-upon values (symbols):
  - Text, spoken language, gestures

## Properties of a Multimedia System

### Flexibility:

- Provide mechanisms to handle all kinds of media, in particular, discrete and continuous media
- A VCR and a desktop publishing system for text and graphics are no multimedia systems.
- An editor with voice annotation is a multimedia system.

### Integration:

- Independent media storage
- Computer-controlled media combination

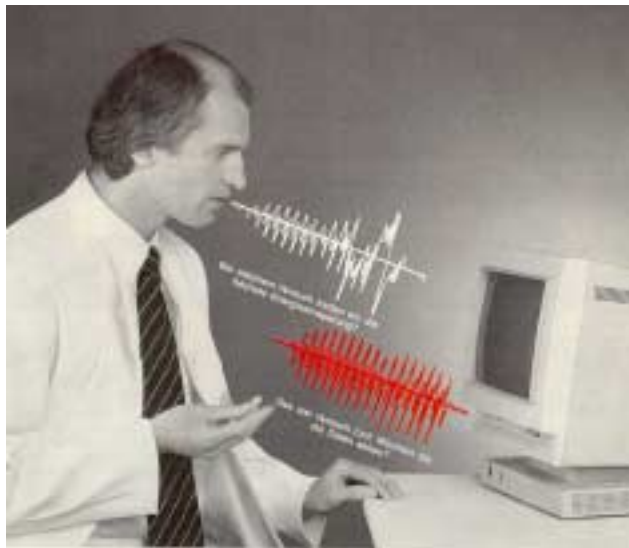
### Definition:

- ***A multimedia system is characterized by the integrated computer-controlled handling of independent discrete and continuous media.***

## Essential Elements of Multimedia

### Essential Elements are:

- Immersion
- Interdisciplinarity
- Hypermedia
- Interactivity
- Narrativity



## A new definition of Multimedia:

Simulation is the representation or replica of specific aspects of a real world system, in particular of its behaviour in time. The simulation allows us examination or manipulation, which's realization would be too dangerous, too expensive or even impossible in reality.

Simulation of Human Communication

Mind and Machine

## Questions

1. Persons and their contributions to the history of multimedia
2. Presentation dimensions
3. General type of media
4. Presentation space and value classes
5. A technical and a content based definition of multimedia
6. Essential elements of multimedia
7. What does simulation means?

## Some interesting links

Multimedia Glossary

Glossary

Multimedia/Entertainment Industry Law & Business Information Center  
<http://www.dnai.com/~pzender/index.html>

Multimedia: From Wagner to Virtual Reality - presenting the untold history of multimedia.  
<http://www.artmuseum.net/w2vr/project.html>

As We May Think - this paper by Dr. Bush calls for a new relationship between thinking man and the sum of our knowledge. <http://www.ps.uni-sb.de/~duchier/pub/vbush/vbush.shtml>

Web Directory: Hypermedia Hypertexts (uni-konstanz.de) - Index of resources on Hypertext on the net [http://www.inf-wiss.uni-konstanz.de/Res/hypertext\\_e.html](http://www.inf-wiss.uni-konstanz.de/Res/hypertext_e.html)

IEEE Multimedia - features the latest practical information on research and applications in multimedia hardware and software. <http://www.computer.org/multimedia/>

PROJECT XANADU® Founded 1960 • The Original Hypertext Project  
<http://xanadu.com/>

The History and the Future of the World Wide Web  
<http://www.palevich.com/Articles/a4d3.html>

A Little History of the World Wide Web <http://www.w3.org/History.html>

The History of the World Wide Web <http://www.w3history.org/>

What is Simulation? <http://www.solutionsbase.co.uk/simulation/simulation.htm>