3º Encontro Português de Computação Gráfica

Conferência

Computação Gráfica

Perspectivas Actuais e Futuras

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Development of CG

1960-1970 CG

- graphics programming

1970-1980 Interactive CG

- computer-aided applications (CAX)
- databases
- interfaces
- basic algorithms

1980-1990 Intelligent CG

- realistic image rendering
- standards
- intelligent user interfaces
- high-performance sytems

CG today

High-performance:

- supercomputing technology for
  workstations
- accelerators
- special modules
- hardware support of
  software interfaces
- new storage media (e.g., optical disk)
- multimedia workstations

Visualization:

- application-dependent renderings
- application-dependent dialogues
- intelligent user interfaces
- display of supercomputing results
- video output

Summary
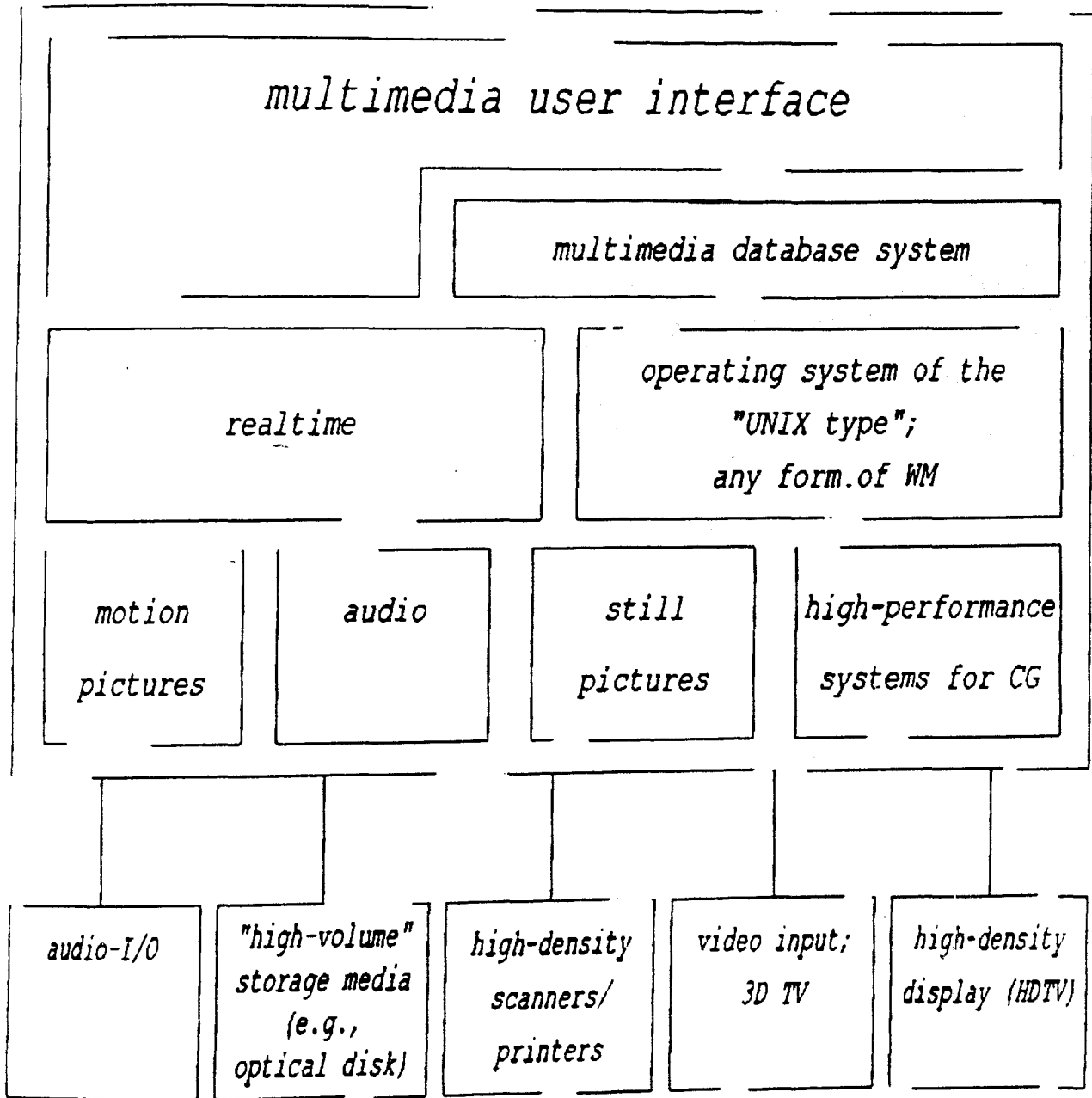
CG as Man-Machine-Interface

1990-2000 PARTNERSHIP!

      (medium-term goal of FhG-AGD)

>2000   _FRIENDSHIP??!!..._

      (see also Yoshikawa, Uni Tokyo)

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CG Future II Workstation

multimedia user interface

multimedia database system

realtime

operating system of the
"UNIX type";
any form.of WM

| motion pictures | audio | still pictures | high-performance systems for CG |

| audio-I/O | "high-volume" storage media (e.g., optical disk) | high-density scanners/ printers | video input; 3D TV | high-density display (HDTV) |

CG Vision

	Future I (until 1995)
high computing and storing capacity of the particular workstations	CPU: 100 MIPS, 200 MFLOPS architecture of the graphics system: 5-10 GIPS, 10-20 GFLOPS; digital optical disk (passive)
high integration and miniaturization	display processor: 1 MTrans., 100 ns memory cycle, 32 bit bus; 3D graphics processor: 200 K polygons/s transformation: 1 M vertices/s scan conversion: 2 M segments/s display processing: 100 MPixel/s
new input and output devices and media	highspeed rendering of high-density, digital images with acustic playback and voice I/O
distributed applications	high-performance shading and rendering; hardware-aided radiosity and texture mapping (dynamic); consideration of time dependences
realization of inter-disciplinary concepts in novel system architectures	multimedia applications

CG Vision

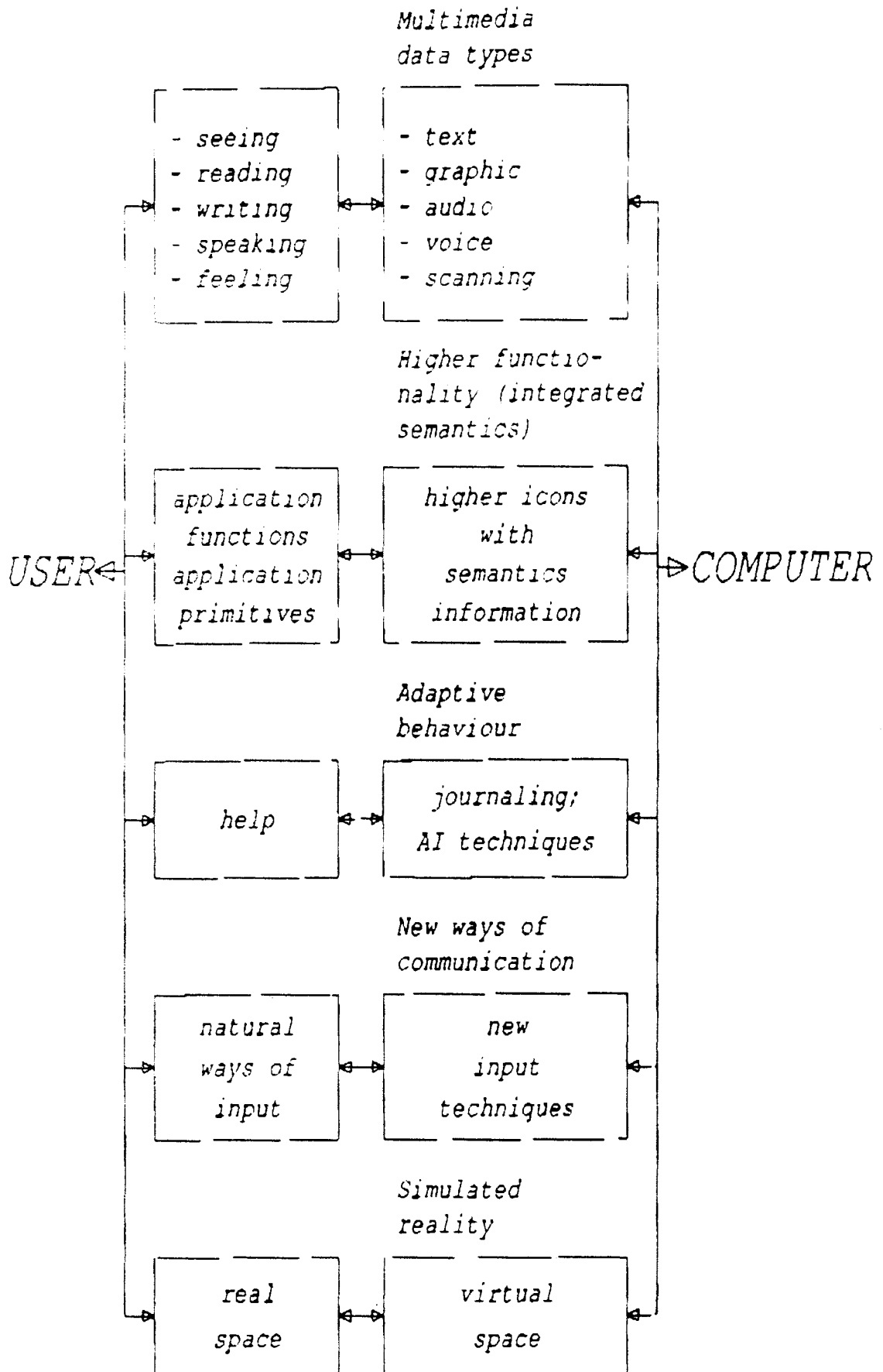|	Future I (until 1995)
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new input and output devices and media	*highspeed rendering of high-density, digital images with acustic playback and voice I/O*
distributed applications	*high-performance shading and rendering; hardware-aided radiosity and texture mapping (dynamic); consideration of time dependences*
realization of inter-disciplinary concepts in novel system architectures	*multimedia applications*

FhG-AGD   *J. Encarnacao*

Multimedia
data types

```
┌─────────────┐   ┌─────────────┐
│ - seeing    │   │ - text      │
│ - reading   │   │ - graphic   │
│ - writing   │←→ │ - audio     │
│ - speaking  │   │ - voice     │
│ - feeling   │   │ - scanning  │
└─────────────┘   └─────────────┘
```

Higher functio-
nality (integrated
semantics)

```
┌─────────────┐        ┌─────────────┐
│ application │        │ higher icons│
│ functions   │        │    with     │
USER←│ application │←→  │ semantics   │  →COMPUTER
│ primitives  │        │ information │
└─────────────┘        └─────────────┘
```

Adaptive
behaviour

```
┌─────────────┐        ┌─────────────┐
│             │        │ journaling; │
│    help     │←→       │ AI techniques│
│             │        │             │
└─────────────┘        └─────────────┘
```

New ways of
communication

```
┌─────────────┐        ┌─────────────┐
│ natural     │        │    new      │
│ ways of     │←→       │   input     │
│ input       │        │ techniques  │
└─────────────┘        └─────────────┘
```

Simulated
reality

```
┌─────────────┐        ┌─────────────┐
│   real      │        │  virtual    │
│   space     │←→       │   space     │
└─────────────┘        └─────────────┘
```

Scenarios

- medical-technical laboratory

- teleanimation

- distributed project development

- teledistribution

- interactive multimedia education

- field service support system

- process control and monitoring systems

- multimedia newsletter