Interactive multimedia news presentation on very low bitrates

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Rich multimedia news delivery

- Animation, voice, graphics

Interactive

- News on demand

Easy access

- Low bandwidth, low processing power

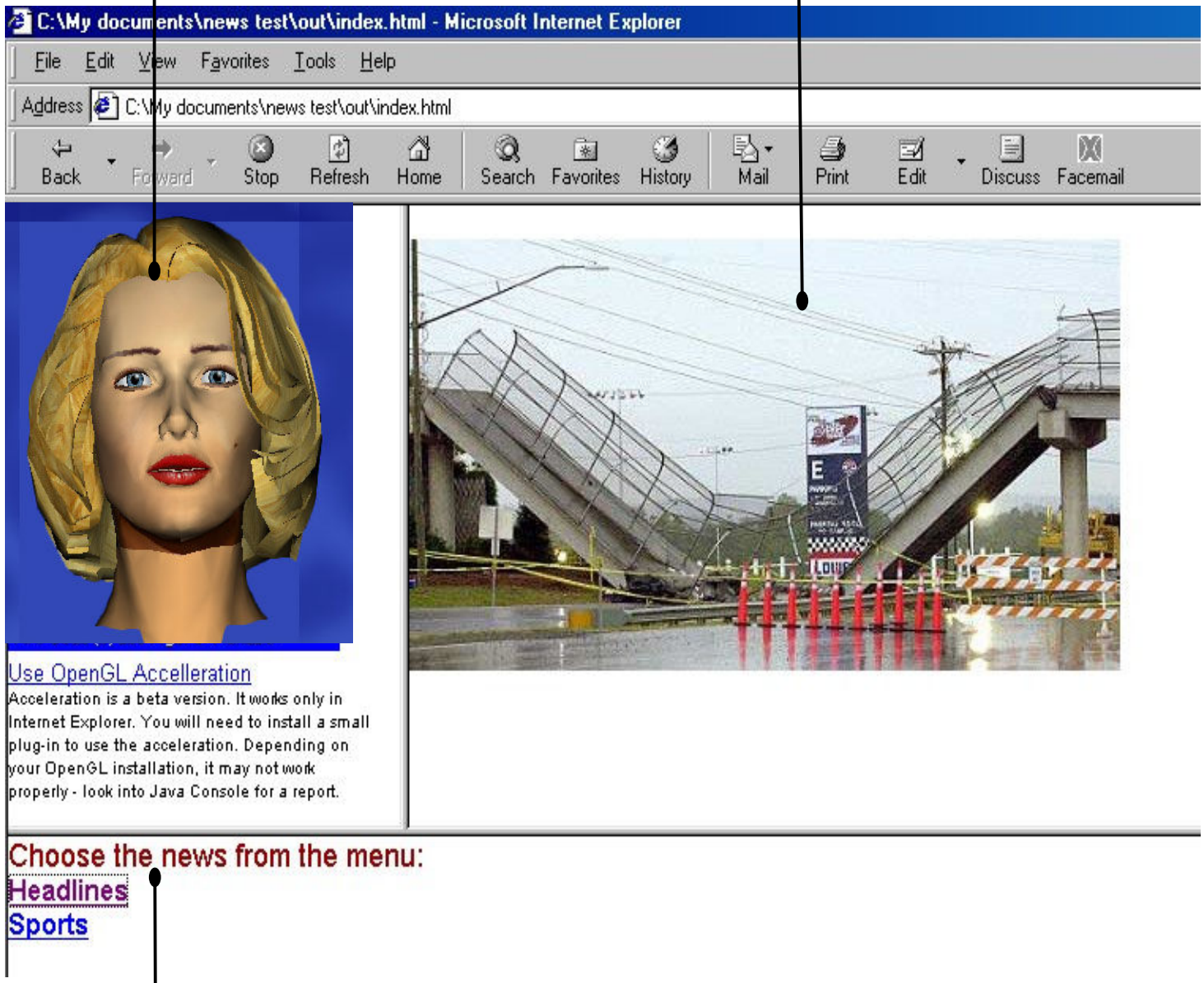
Automatic

- Content generation from news data base

System user's view

MPEG-4 FA Player Applet

Dynamic graphics area



News selection area

System: how it works

ewscaster 3D
face model

neric MPEG-4
orph targets

Facial Motion Cloning

Newscaster morph targets creation

Newscaster now ready for animation

g the Newscaster – one-time process

uctured news
(XML)

ges & graphics

News processing

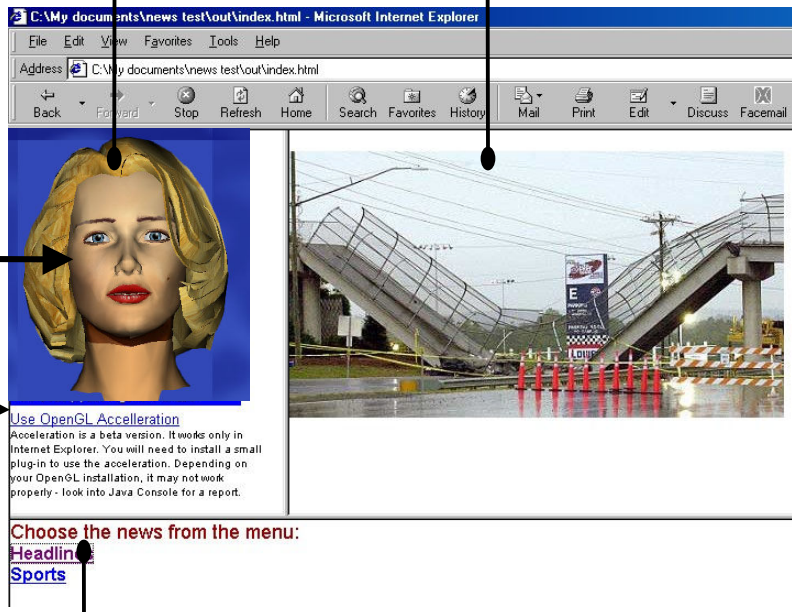
Visual speech synthesis

Dynamic web pages creation

g the News – repeated process

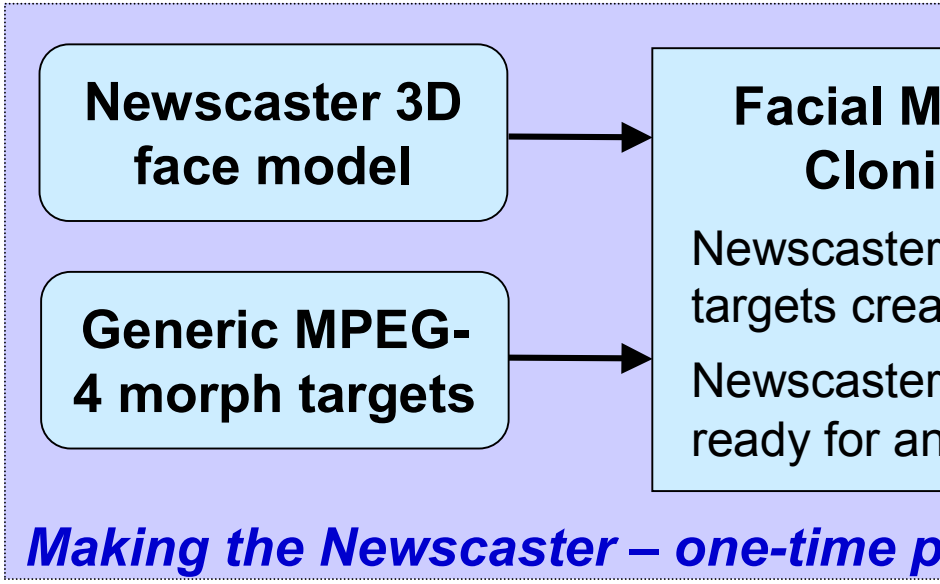
MPEG-4 FA Player Applet

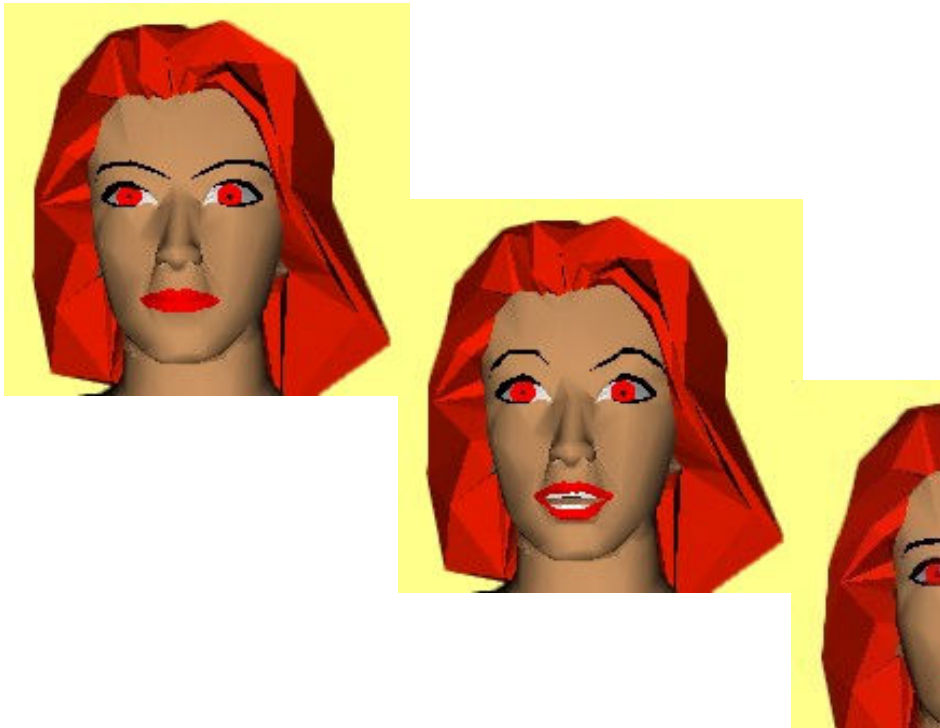
Dynamic graphics a



News selection area

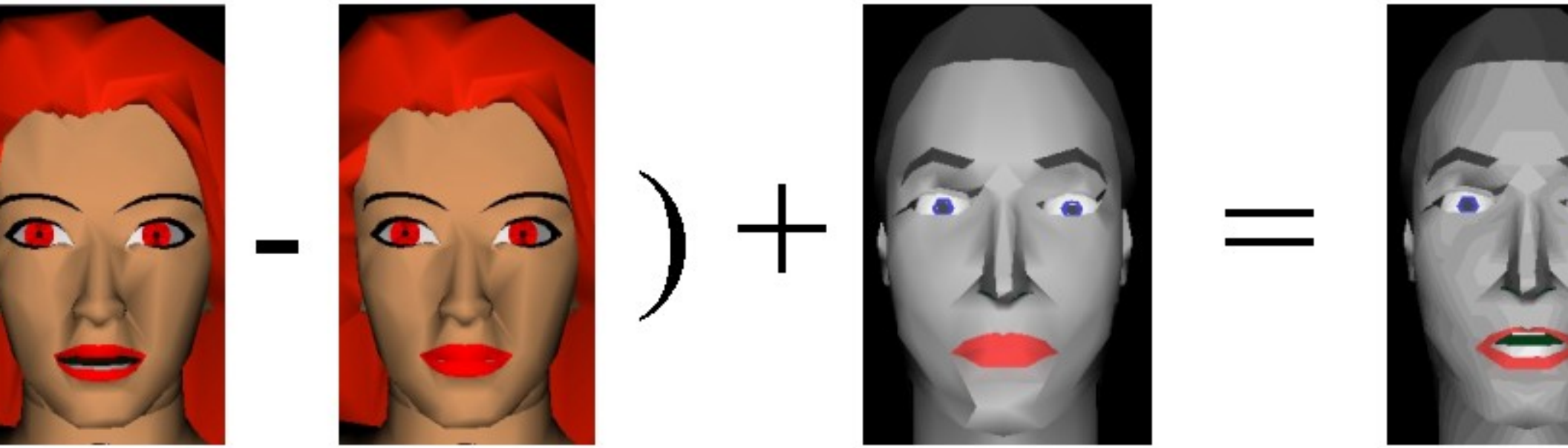
- Create a 3D face model
- Create morph targets for the model
- Construction of models and animations using standard 3D tools
- Problem: morph target creation tedious
- Solution: Facial Motion Cloning



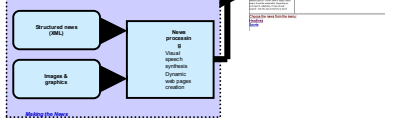


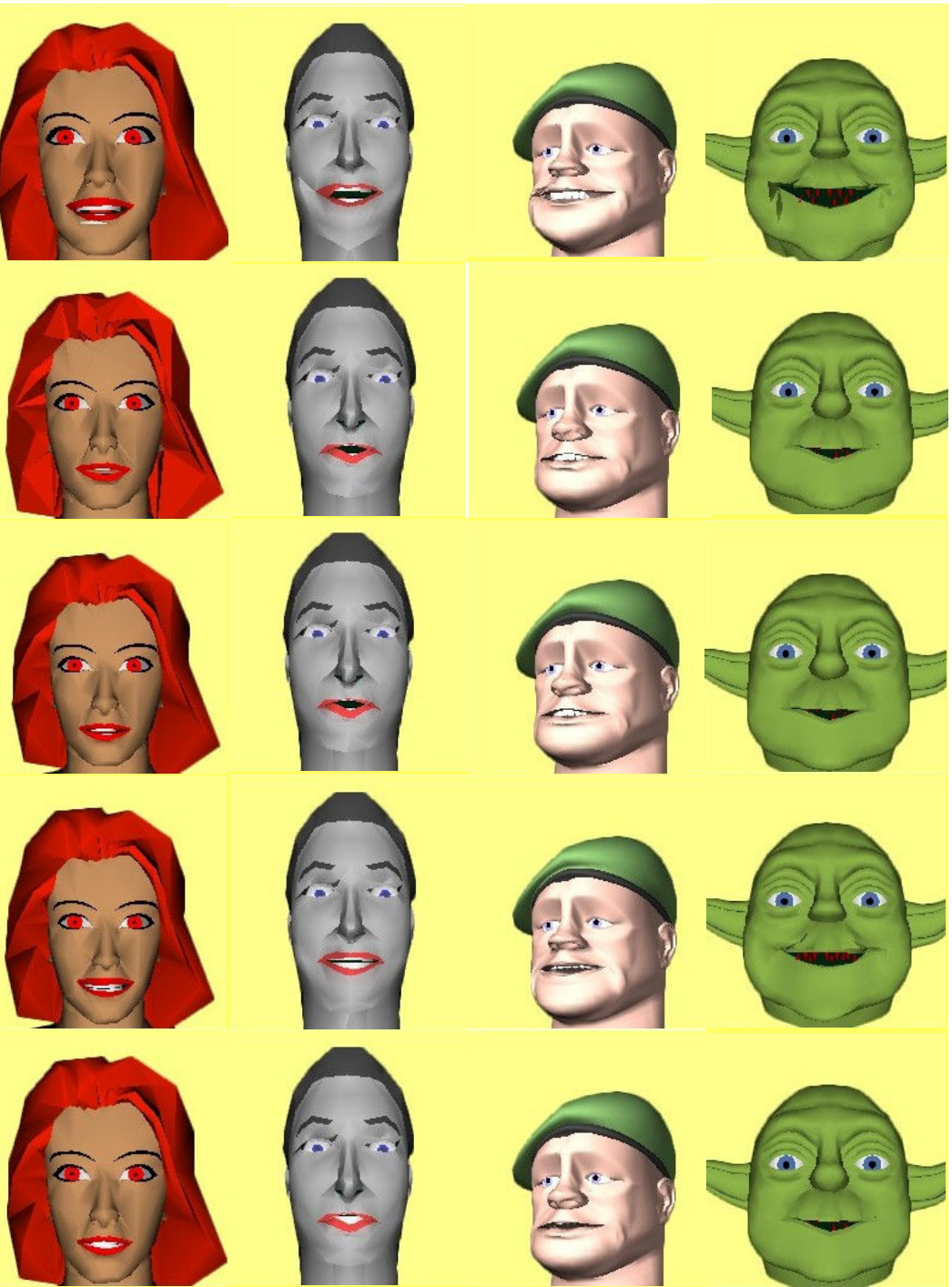
Fast production of new face models for animation

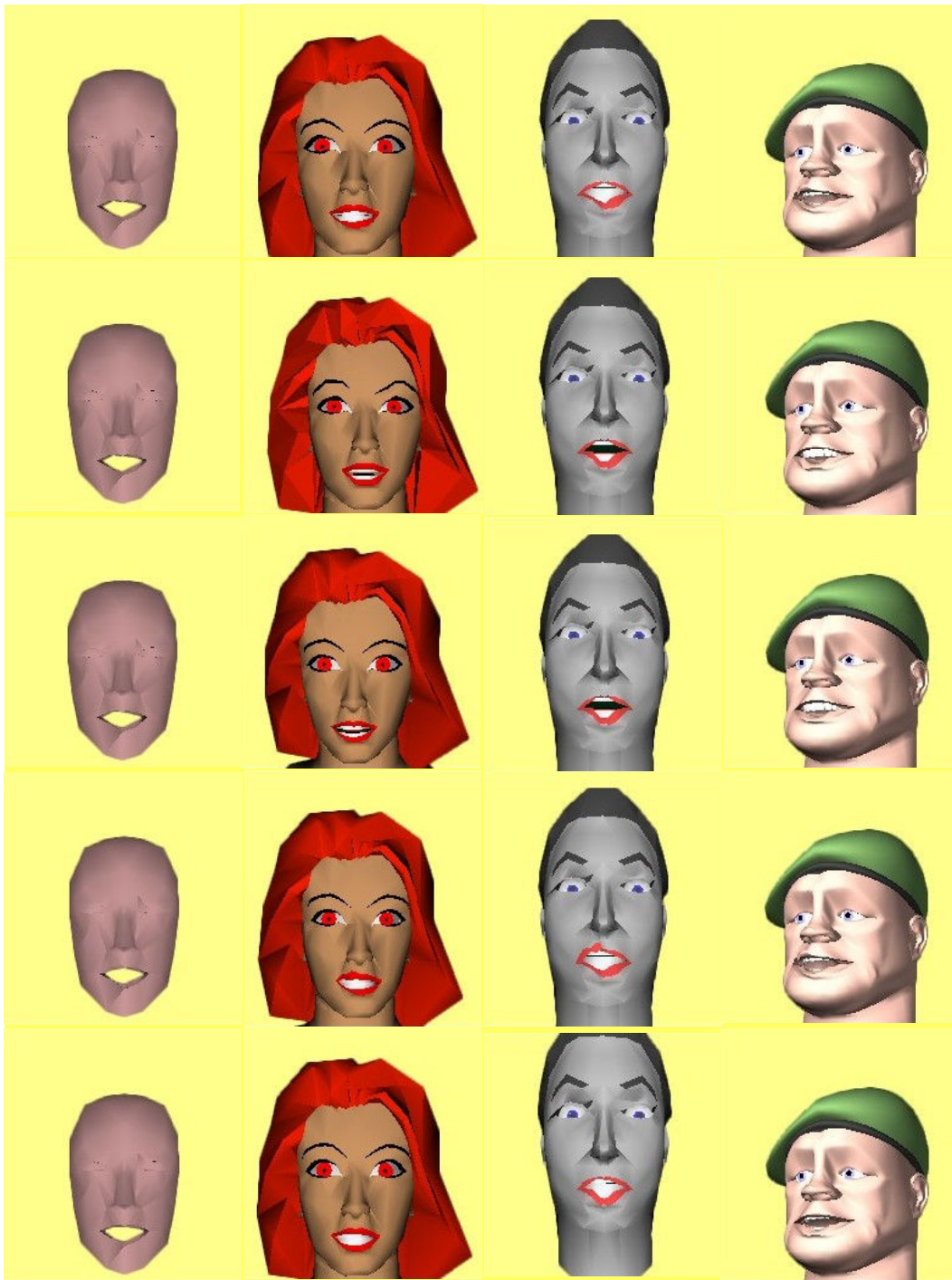
Automating the morph target approach, the common way of animating faces

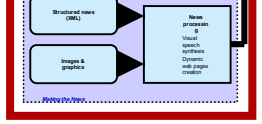


ial Motion Cloning

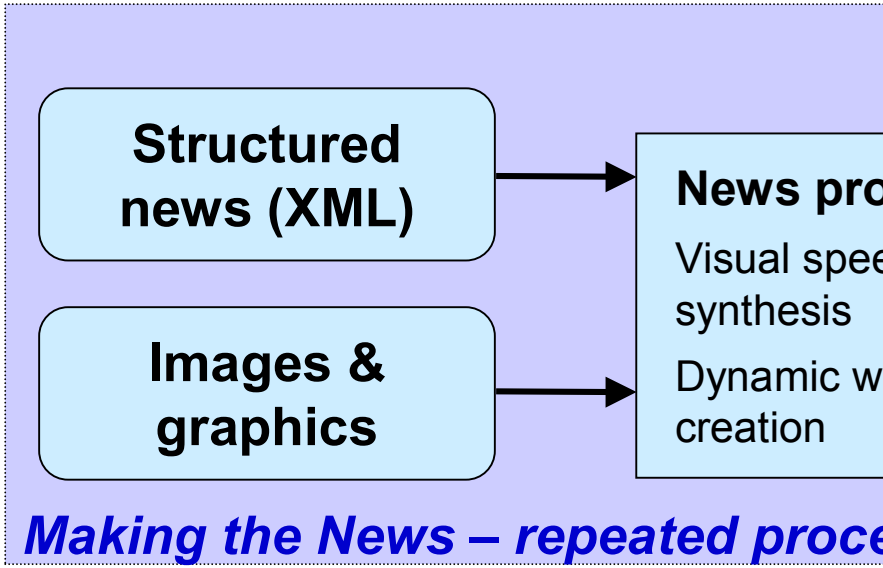


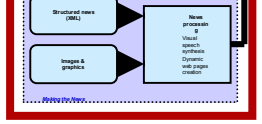




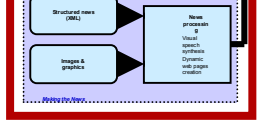


- News organised by topic in simple XML format
- News items contain references to image files
- Visual speech synthesis: create voice and animation
- Create web site structure with appropriate links





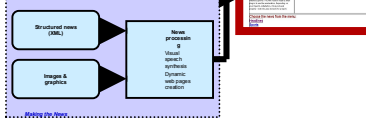

```
xml version="1.0" encoding="ISO-8859-1"?>
ews>
 <logo>newslogo.jpg</logo>
 <introduction>Welcome to the interactive news.</introductio
 <voice>Mary</voice>
 <topic>
      <name>Headlines</name>
      <item>
            <text>U.S. airstrike hits Baghdad.</text>
            <image>baghdad.jpg</image>
      </item>
      <item>
            …
      </item>
      …
 </topic>
 …
news>
```



XML format can be extracted from a content management system

Structure can easily be extended

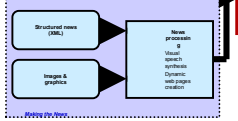
News on demand can be supported with personalised news composition



Requirements:

- Virtual newscaster (streaming face animation and audio)
- Dynamic graphics synchronised with presentation
- Must work in standard browser

ISO Face Animation



ISO standard since 1999.

- Work started in 1996.

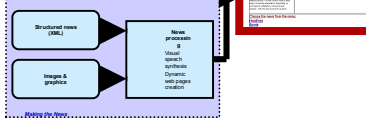
Only standard for FA

Widely accepted in academia

Spreading into industry as new products emerge

Standard also includes Body Animation

MPEG-4 Face Animation: Summary



Complete

- Large range of expressions

Efficient

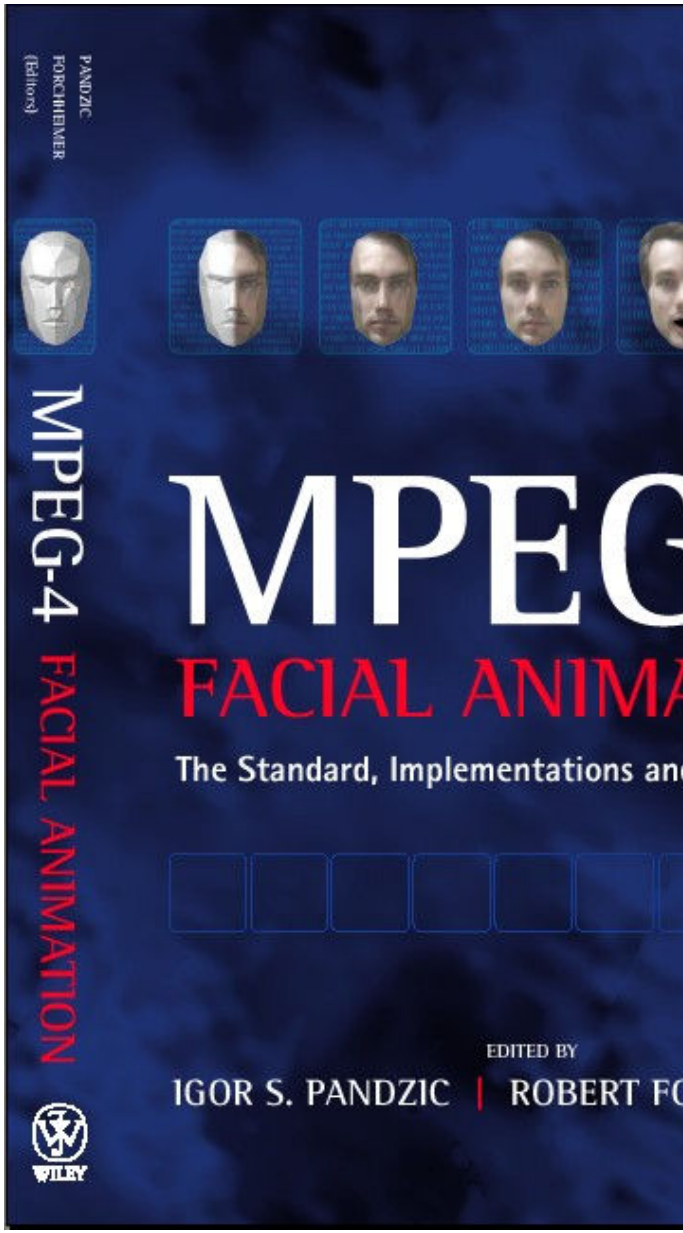
- No redundancy
- Compressed to low bitrates

Relatively simple

- Face animation parameters displace feature points from neutral position
- Face definition parameters allow personalisation in a scalable manner

Portable & reusable

- Animation parameters are model-independent

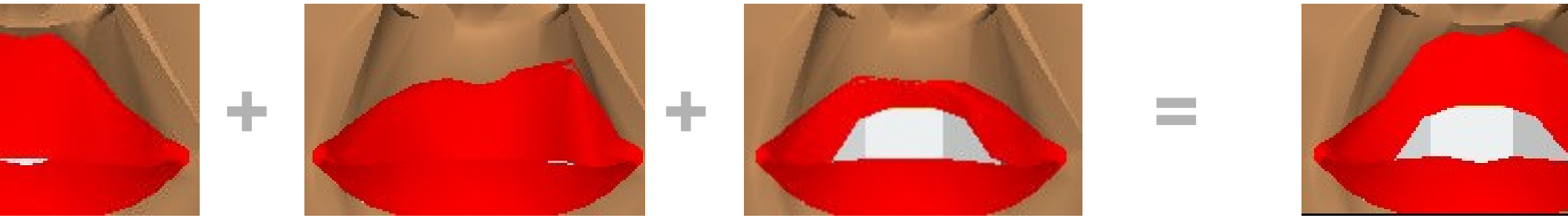


PEG-4 FBA decoder

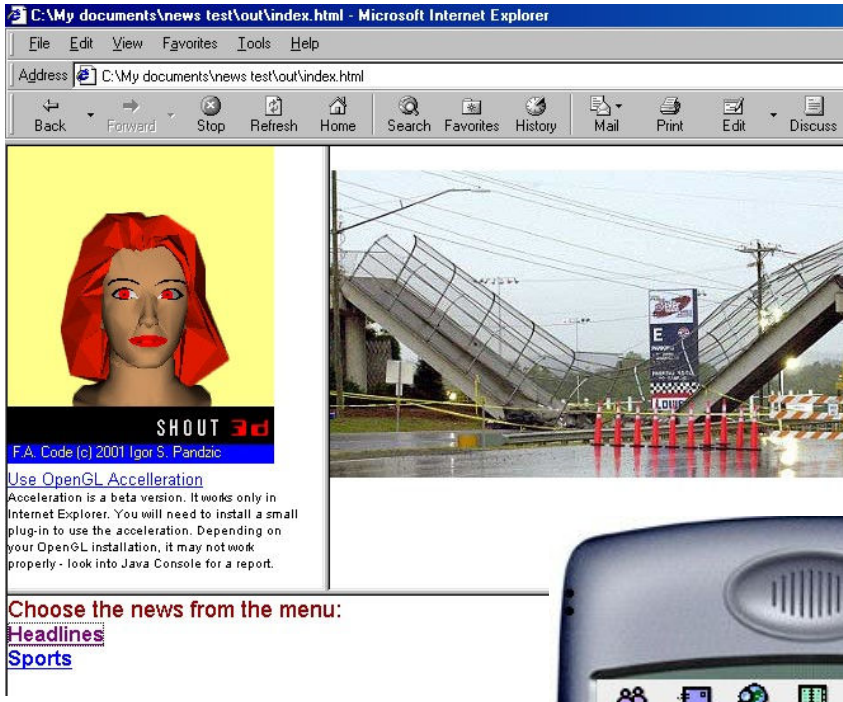
mple FA: weighted morph targets

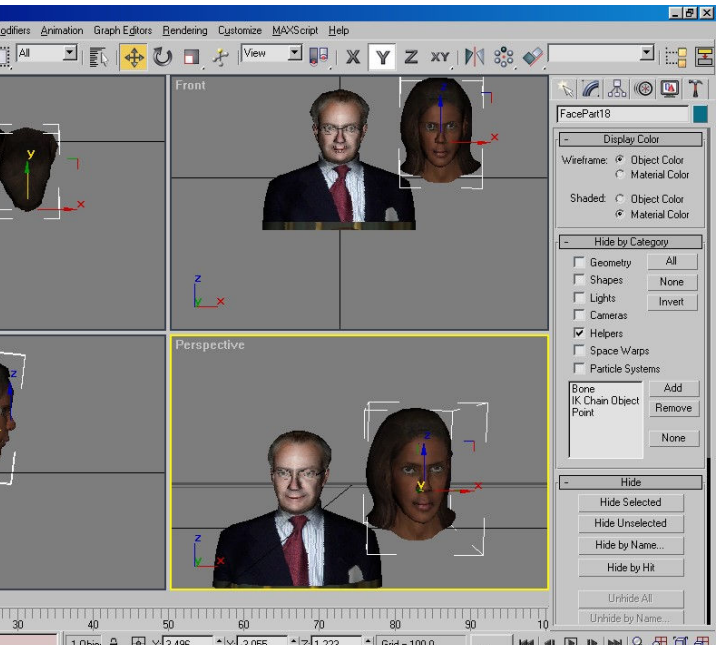
ghtweight implementation

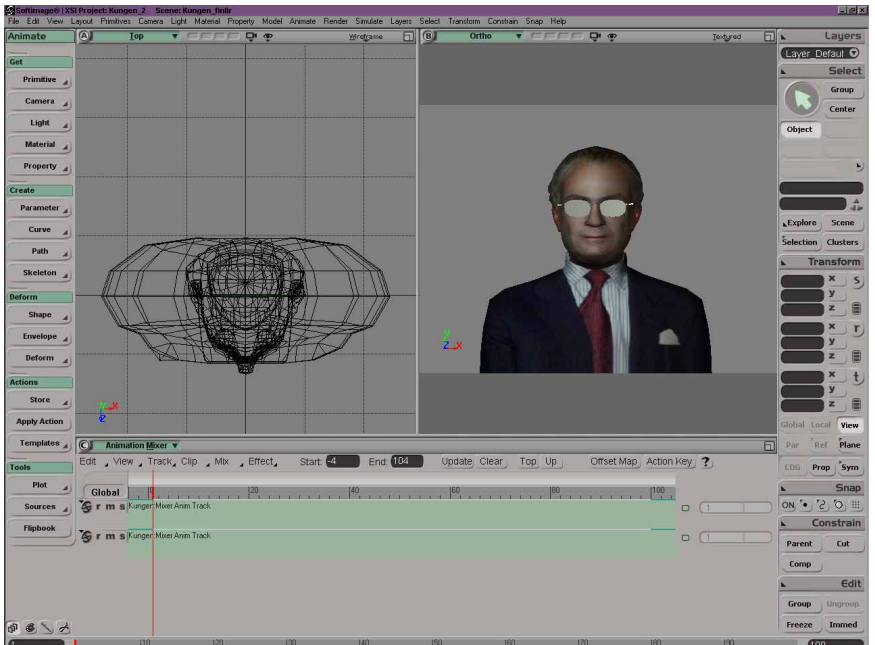
sily portable to any platform

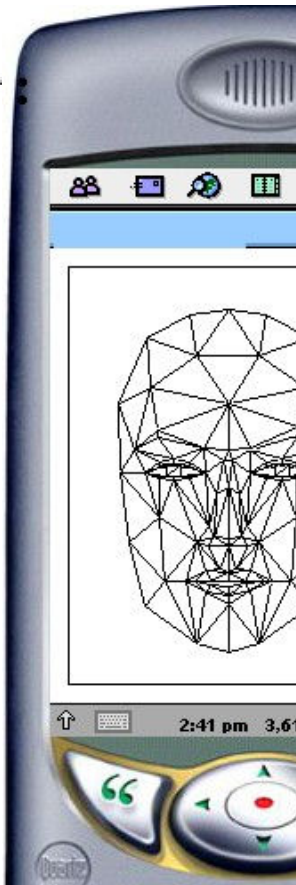


va applet, Shout3D rendering
gine
mbian, iPAQ early prototypes
C standalone
s max plugin
oftimage dotXSI export

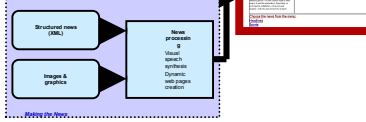








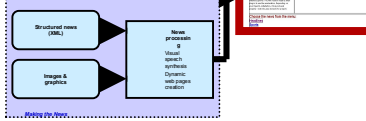
...let player bandwidth requirements



- Applet size: ~150K
- FBA bitstreams
  - viseme-encoded: ~0.3 kbit/s
  - low-level FAPS: 2-6 kbit/s
- Audio (GSM 6.10): 13 kbit/s
- Face model: 50K reasonable

Acceptable for modem connections

...et player graphics performance



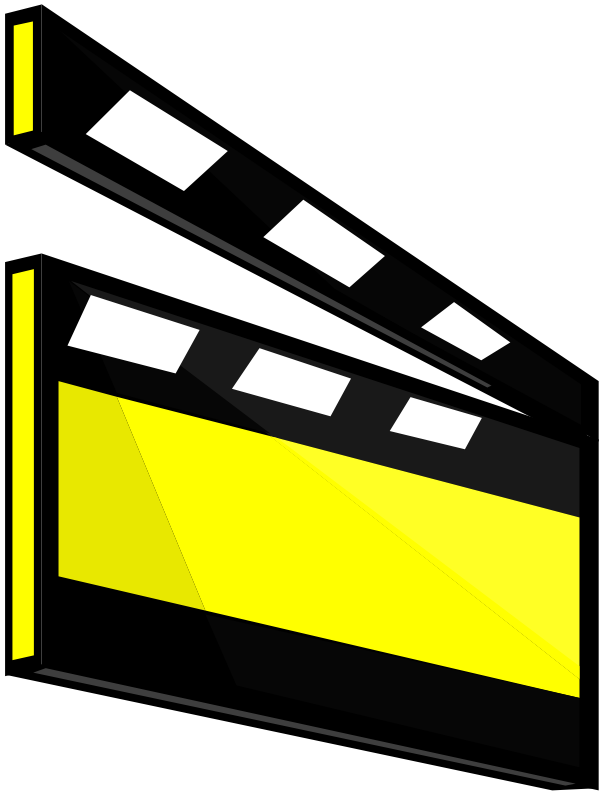
Zavod za teleko

Model	Polygons	Size (KB)	Frames/secon	
			C1	C2
Demy	2800	32	11,5	16
Dummy	1368	50	16,5	21
Jörgen	168	40	22	30
Candide	108	4	35	60
MIRAface	3692	67	10,5	16
Lake	16917	284	0,97	1

Acceptable for AVERAGE PC

C1= P3/600 C2 = P3/1000

mparison with other news media

	News on demand	Speech	Video	Automatic content production	Delivery
paper	●	●	●	●	PAPER
	●	●	●	●	RECEIVER
	●	●	●●	●	TV SET
ard web site	●	●	●	●	STANDARD I
l Newscaster	●	●	●	●	STANDARD I

An automatically created web site with some (old) news