Retrieving the Visual via the Verbal

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My interests…

Theories and technologies that enable new ways for people to understand, remember and communicate about their worlds

- ➢ '**Computational semiotics':** a computational understanding of how multimedia documents conveys meaning → analyse and structure multimedia data

- ➢ Working with a **variety of multimedia archives**, especially in specialist domains (dance, art, crime scenes, feature films), and recently the Web

- ➢ Focus on understanding and exploiting the **relationship between visual and verbal information**

Retrieving the Visual via the Verbal

"One way to resolve the *semantic gap* comes from … integrating other sources of information about the image…   Information about an image can come from a *number of different sources*: the image content, labels attached to the image, images embedded in a text, and so on. We still have very *primitive ways of integrating this information* in order to optimize access to images"

(Smeulders et al. 2000)

Retrieving the Visual via the Verbal

➢ Use keywords from HTML to index still images: **WebSEEK, Google, AltaVista**

➢ Use keywords from speech stream / subtitles to structure and index video data: **Informedia, Físchlár-TV, Google Video, BlinkxTV**

➢ Learn correlations between visual and verbal features for image classification / retrieval: **(Barnard et al. 2003), (Yanai 2003)**

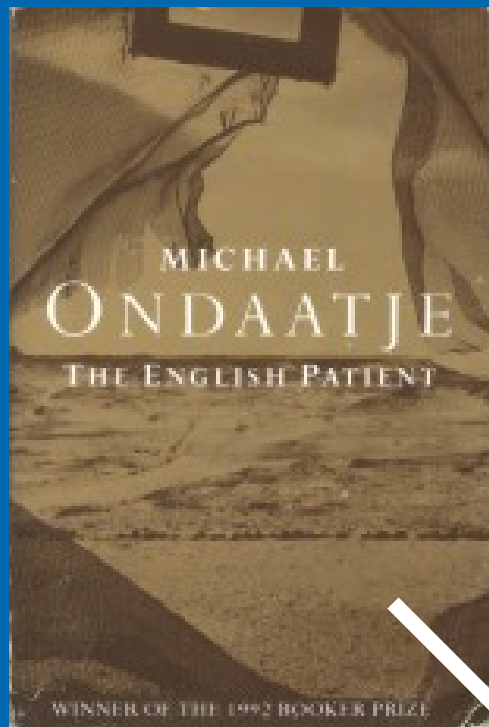**All these systems exploit *collateral text***

Idea One

Retrieve and browse video data on the basis of narrative structures

➔ extract representations of narrative structures in films from collateral texts

Idea Two

Develop an understanding of how the 'whole' of a multimedia document conveys meaning beyond the sum of its parts

➔ classify and make use of the relations between verbal and visual media types in systems that analyse and generate multimedia documents

MICHAEL
ONDAATJE
THE ENGLISH PATIENT

WINNER OF THE 1992 BOOKER PRIZE

Based on the Novel by Michael Ondaatje
The English Patient
A Screenplay

Anthony Minghella
Now a Major Motion Picture from
Miramax Films

AUDIO DESCRIPTION

[12.09] Hanna jumps from the lorry.
[12.20] Desperately she runs towards the mangled jeep.
[12.27] Soldiers try to stop her.
[12.31] She struggles with the soldier who grabs hold of her firmly.
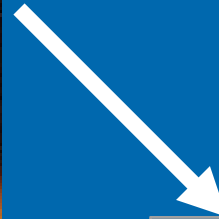
PLOT SUMMARY

The moving story of an English mapmaker and his dying memories of the romance that tragically alters his life. Burned horribly in a fiery crash after being shot down while crossing the Sahara Desert during WWII, he is tended to by a Canadian nurse ...

Audio Description

➢ Subtitles allow the deaf and hard-of-hearing to read what they cannot hear: **audio description** allows the blind and visually-impaired to hear descriptions of what they cannot see

➢ In between dialogue the describer gives essential details about on-screen scenes and events, and about characters' actions, appearances, gestures and expressions.

➢ Audio description is increasingly available internationally on television, in cinema and on VHS/DVD releases.

➢ In UK 3-4 major film releases a week are described (with a back catalogue approaching 1000 films) – 200+ cinemas provide audio description; RNIB campaigning for 50% of broadcast television to be described

Audio Description

➔ **An important and interesting scenario to investigate audiovisual translation**

➔ **A promising resource to exploit for structuring and indexing video data**

Audio Description

[11.43] Hanna passes Jan some banknotes.

[11.55] Laughing, Jan falls back into her seat as the jeep overtakes the line of the lorries.

[12.01] An explosion on the road ahead.

[12.08] The jeep has hit a mine.

[12.09] Hanna jumps from the lorry.

[12.20] Desperately she runs towards the mangled jeep.

[12.27] Soldiers try to stop her.

[12.31] She struggles with the soldier who grabs hold of her firmly.

[12.35] He lifts her bodily from the ground, holding her tightly in his arms.

Narrative Structures

Stories involve chains of events in cause-effect relationships occurring in space and time, where the agents of cause-effect are characters with goals, beliefs and emotions.

(Bordwell and Thompson 1997)

Extracting Information about Emotions
(Salway and Graham 2003)

➢ Stories revolve around characters' changing mental states: computer needs information about mental states to 'understand' the story of a film

➢ Audio Description does not comment on characters' mental states explicitly, but does indicate emotions with visible manifestation

She is resting <u>peacefully</u>…
She peers <u>anxiously</u>…

Extracting Information about Emotions
(Salway and Graham 2003)

METHOD

➢ Used 22 'emotion types' (Ortony, Clore and Collins 1988)

➢ Created lists of 600+ 'emotion tokens' for each type; used WordNet on grammatical variants of type names

  FEAR: fearful, nervously, desperately, terrified…

  JOY: joy, contented, cheerful, delighted…

  HOPE: hope, expectation…

➢ Map emotion tokens → emotion types (record timecode)

Extracting Information about Emotions
## (Salway and Graham 2003)

RESULTS

- Preliminary evaluation:
  - 10 subjects identified 19 instances of emotions in 10 film sequences (majority decision). Our method extracted 23 instances of emotions.
  - 12 out of 19 → 63% recall
  - Of remaining 11, 7 were identified by 1 or more subjects → 4 false positives (83% precision)

- Plotting the emotion types against time suggests that we can access some aspects of narrative structure

Emotions Extracted for *Captain Correlli's Mandolin*
52 tokens of 8 emotion types
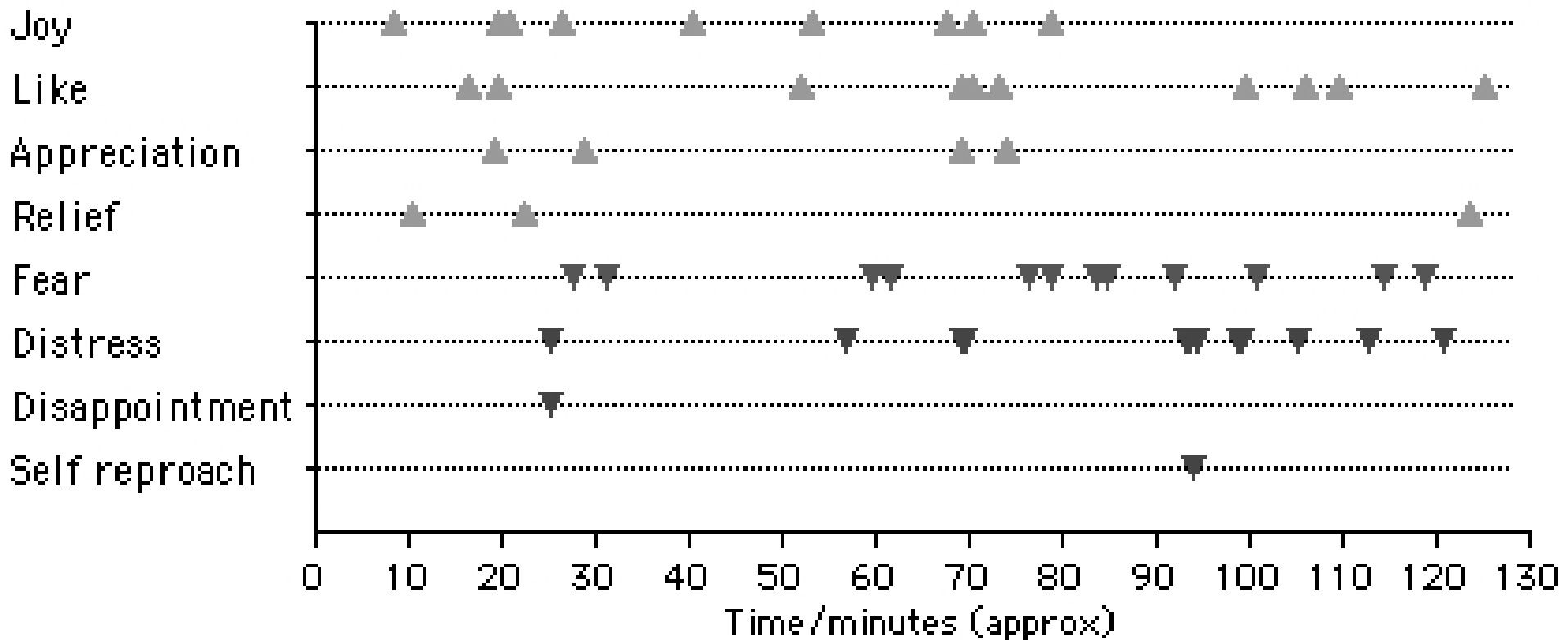
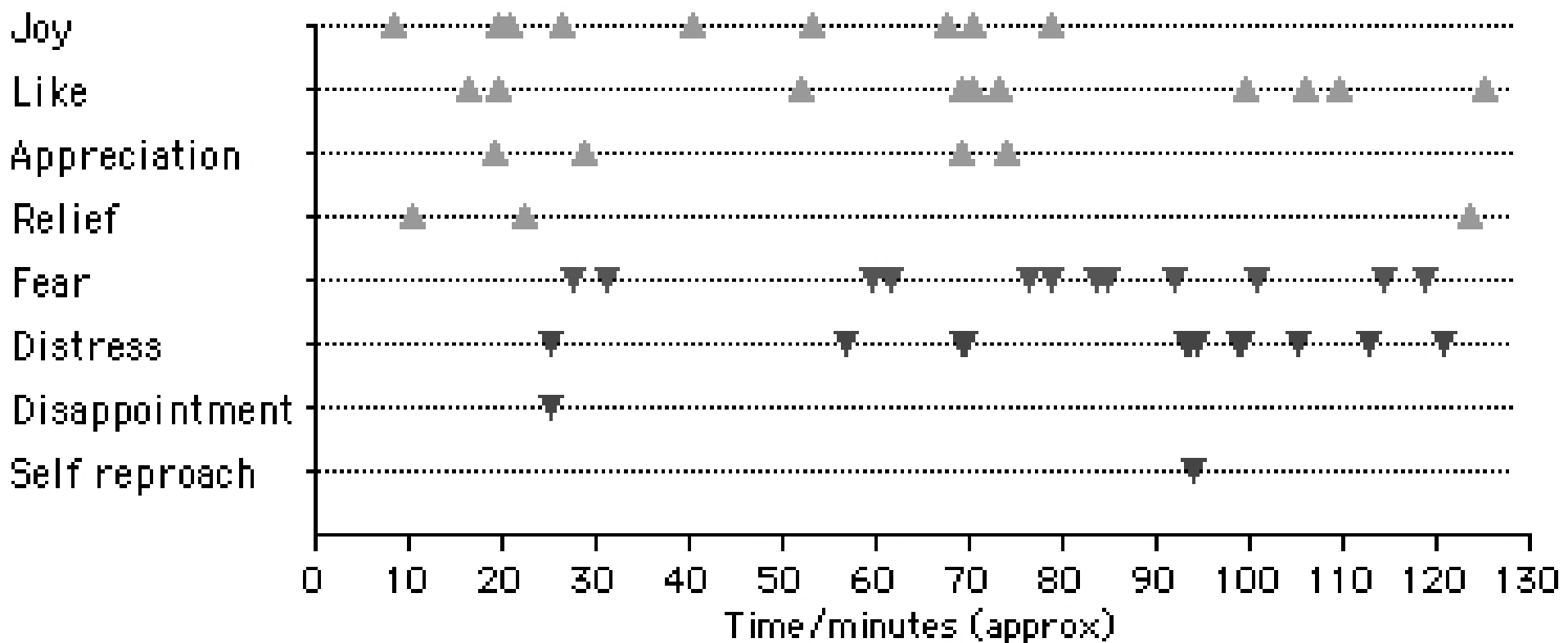# Emotions Extracted for *Captain Correlli's Mandolin*
52 tokens of 8 emotion types

15-20 minutes: Pelagria's betrothal to Madras
20-30 minutes: invasion of the island
68-74 minutes: Pelagria and Correlli's growing relationship
92-95 minutes: German soldiers disarm Italians

Emotions Extracted for *The Postman*

Gone in 60 Seconds

✖	Joy
✖	Distress
✖	Happy for
✖	Sorry for
✖	Resentment
✖	Gloating
✖	Hope
■	Fear
✖	Satisfaction
✖	Fears confirmed
●	Relief
✖	Disappointment
✖	Pride
✖	Self reproach
✖	Appreciation
✖	Reproach
✖	Gratitude
✖	Anger
✖	Gratification
✖	Remorse
✖	Like
✖	Dislike

0   100
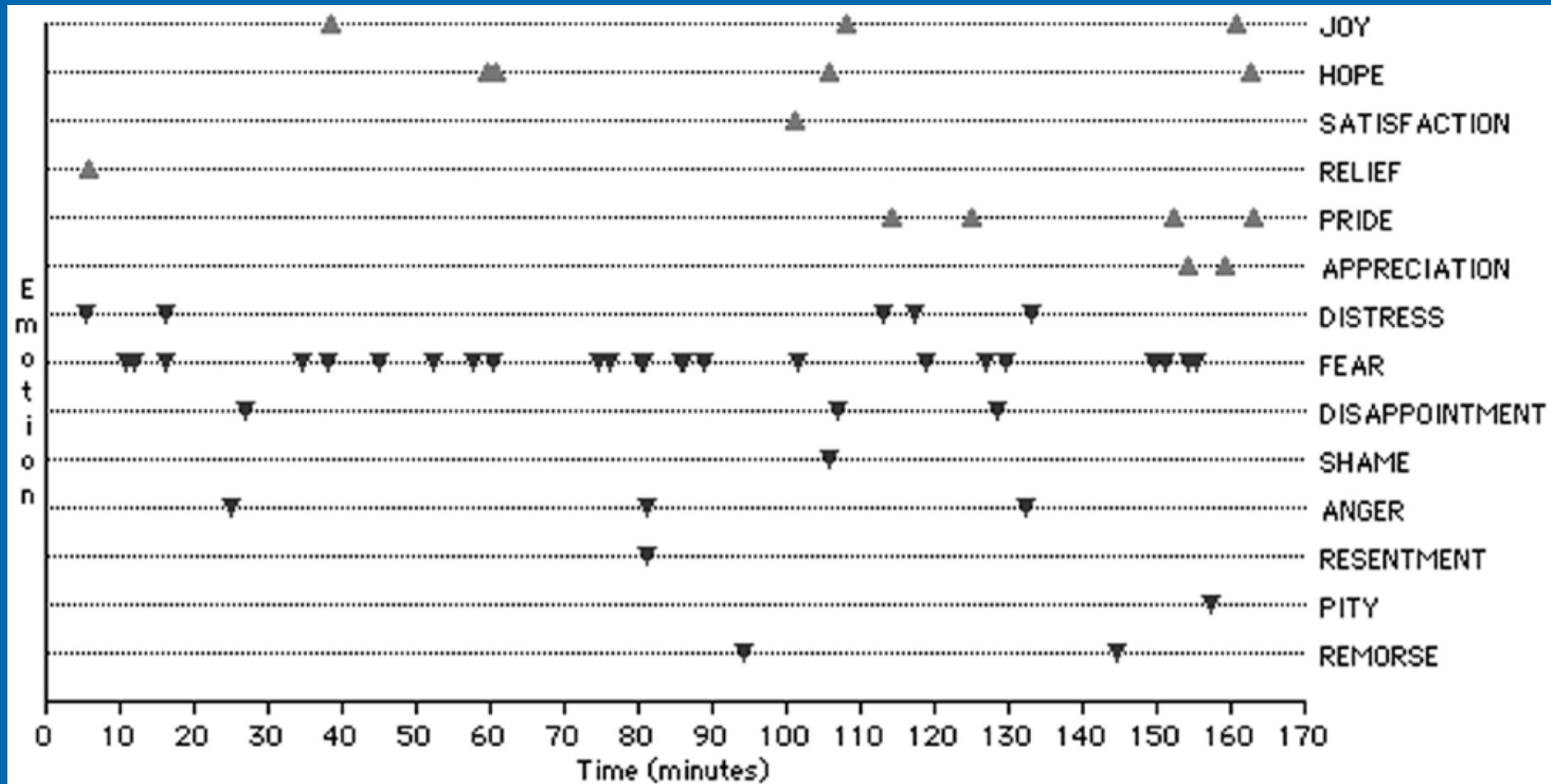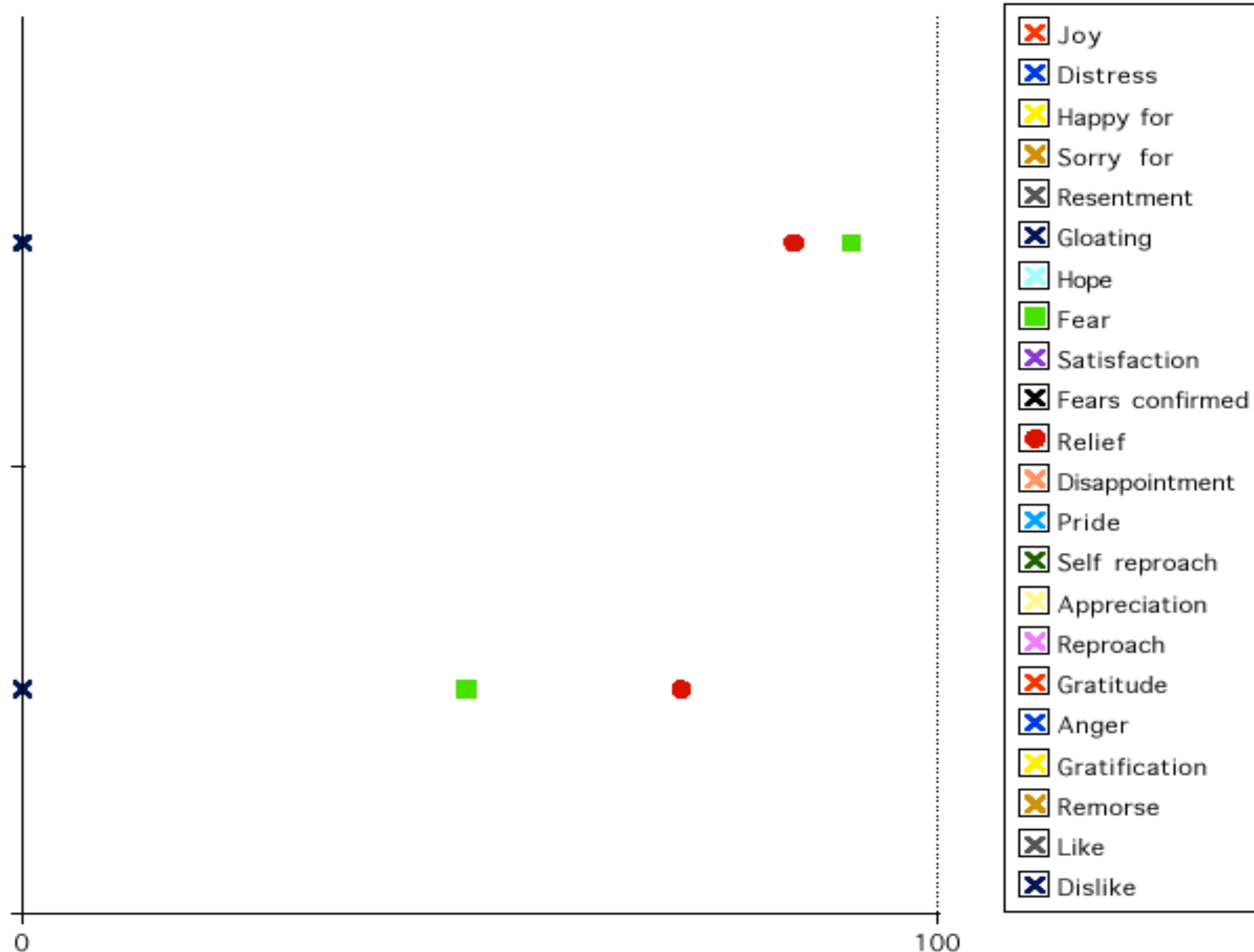
Extracting Information about Emotions
(Salway and Graham 2003)

ONGOING WORK

➢ Improvements to Method

- Make method sensitive to 'strength' of emotions
- Assign emotions to characters
- Integrate information from audio and visual features

➢ Evaluate idea of "video retrieval by story similarity"

➢ Try with film screenplays (NB. time alignment issue)

What Happens in Films?
(Salway, Vassiliou and Ahmad 2005)

➢ Is there a set of events which are common to most films? If so, maybe these are the 'building blocks' used by filmmakers to tell stories, i.e. narrative elements

➢ We could then focus on extracting information about these (from text/visual/audio) and investigate how to generate representations of narrative structure

What Happens in Films?
(Salway, Vassiliou and Ahmad 2005)

METHOD

➢ Screenplay corpus (75 films – 1,971,950 words);

➢ Audio description corpus (45 films – 399,199 words)

Identify frequent non-grammatical words

→ collocation patterns of these words

→ frequent phrases

What Happens in Films?
(Salway, Vassiliou and Ahmad 2005)

RESULTS

Some Common Phrases	Average per Screenplay	Average per Audio Description
look* at (looks at)	29 (17)	11 (8)
turn* to (turns to)	10 (8)	8 (7)
smiles at	2	2
open*/close* the door (the) door open*/close*	6	3

What Happens in Films?
(Salway, Vassiliou and Ahmad 2005)

DISCUSSION

➢ Are these phrases common because they describe primitive actions that are important story-telling elements in films?

- *'looks at'* / *'turns to'* – helps audience to understanding what a character is focussing on and thinking about, or who they are interacting with

- *'smiles* **(ADVERB)** *at'* – conveys a character's emotional reaction to another character, ADVERB = *shyly*, *briefly*, *happily*, etc.

- *'* door *'* / *'* room *'* – information about characters' entrances and exits, can infer who is present in a scene

➢ These results may guide the description and analysis of 'mid-level' semantic video content for films: a stepping-stone in the mapping between visual features and narrative structure

What Happens in Films?
(Salway, Vassiliou and Ahmad 2005)

ONGOING WORK

➢ Automatic extraction of local grammar

➢ Development of IE applications

➢ Exploring novel video retrieval / browsing based on information about:

- Characters' focus of attention
- Non-verbal communication between characters
- Movement of characters and objects
- Scene changes
- Characters' emotions

Cross-document co-reference
(Tomadaki and Salway 2005)

➢ Need to integrate information from multiple text sources to index / structure video data, e.g. MUMIS

➢ The **cross-document co-reference problem** is to identify fragments of different texts that refer to the same entity or event

➢ Previous solutions have concentrated on CDCR between texts of the same type, or on a finite set of events

Audio description
[23:54] Hana makes her patient comfortable

Plot summary
A young, shell-shocked war nurse (Hana) remains behind to tend her doomed patient

Audio description
[45:09] Gently she washes the tender skin on the patient's chest.

Cross-document co-reference
(Tomadaki and Salway 2005)

➤ Corpus analysis suggests linguistic regularities in how plot summaries and audio description refer to common events. BUT, the frequent verbs in each corpus are very different, and cannot be matched with existing thesauri, nor it seems can correlations be identified.

➤ Matching the participants of events and their grammatical roles achieves 50-60% precision and recall. Need more work to resolve references to characters. (More details in Tomadaki's forthcoming PhD).

Hypervideo based on Plot Units
(Salway and Xu 2005)

➢ Hypervideo offers a new way to watch films: 'interactivity' increases…

cinema → television → VHS video → DVD → hypervideo

➢ The NAFI system stores data about 'plot units' so users can browse between related events in a film: plot units are a story representation formalism which associate characters' affect states with events (Lehnert 1977).
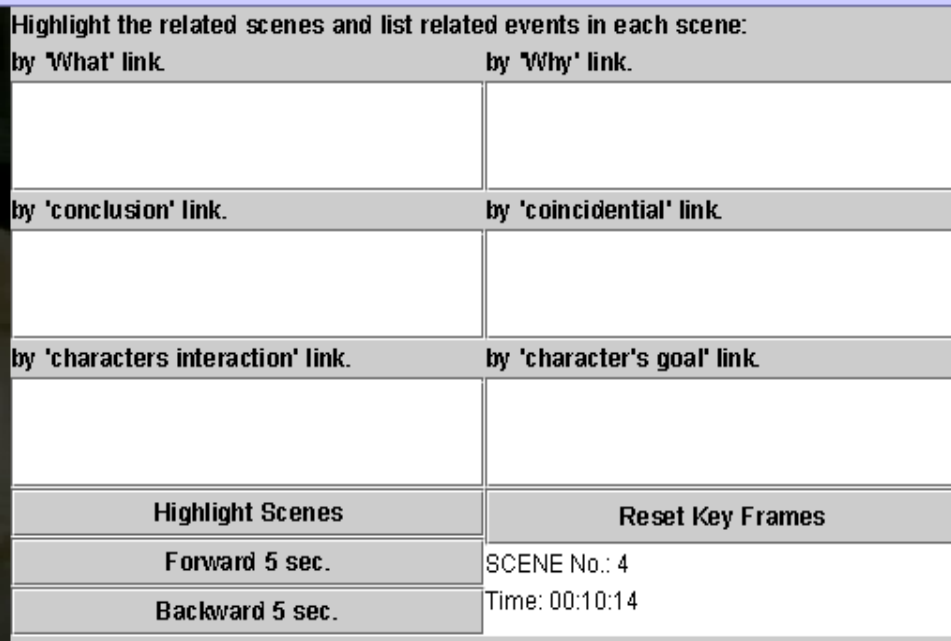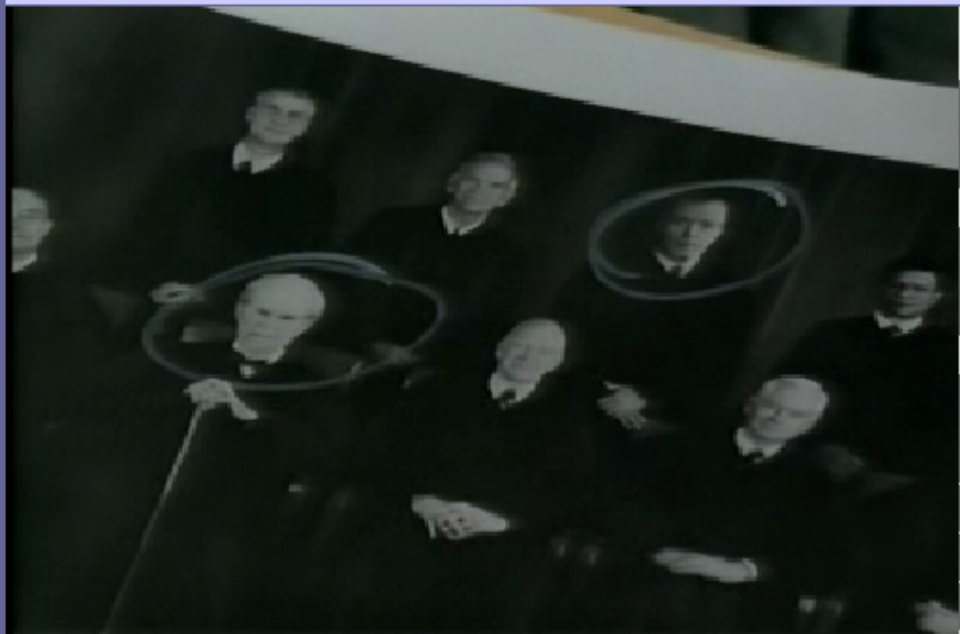
Highlight the related scenes and list related events in each scene:

by 'What' link.

by 'Why' link.

by 'conclusion' link.

by 'coincidential' link.

by 'characters interaction' link.

by 'character's goal' link.

| Highlight Scenes | Reset Key Frames |

| Forward 5 sec. | SCENE No.: 4 |
| Backward 5 sec. | Time: 00:10:14 |

Highlight the related scenes and list related events in each scene:

by 'What' link.

1st Event6, Time: 00:06:55, Scene 2, E
1st Event 5, Time: 00:06:18, Scene 2, E

by 'Why' link.

by 'conclusion' link.

by 'coincidential' link.

by 'characters interaction' link.

by 'character's goal' link.

Event 6, Time: 00:06:55, Scene 2, Even
Event 5, Time: 00:06:18, Scene 2, Even

Highlight Scenes

Reset Key Frames

Forward 5 sec.

Backward 5 sec.

SCENE No.: 2

Time: 00:07:15

Hypervideo based on Plot Units
(Salway and Xu 2005)

- ➢ 30 subjects spent about 2 hours each using NAFI to find answers to questions about the story of *The Pelican Brief* with/without hypervideo links.

- ➢ Some evidence to suggest that when hypervideo links were enabled then subjects gave better and quicker answers. (More details in Xu's forthcoming PhD).

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Queen in Liverpool for ceremony

The Queen is visiting Liverpool for the ancient Maundy Thursday ceremony.

During the service at the city's Anglican cathedral the Queen will hand out money to 78 men and 78 women.

Maundy Thursday marks the washing of the disciple's feet by Jesus. British monarchs used to wash subjects' feet, but James II ended the practice.

The Queen has only missed four Maundy Thursday ceremonies

It is the first time the ceremony has been performed at the cathedral. The locals were selected for their contributions to their communities.

The ceremony is due to take place at 1100 BST.

Organisers have selected 78 men and women as a way of marking the Queen's 78th birthday celebrations which take place on 21 April.

The Queen and the Duke of Edinburgh, will arrive at Liverpool's Lime Street station before being taken the short distance to the cathedral where they will receive the traditional nosegays - posies of strong-smelling flowers.

After the service they will attend a civic reception at Liverpool Hope University.

Lord Mayor of Liverpool, Councillor Ron Gould, said: "It is a wonderful honour that the Queen has chosen to visit Liverpool this year for the Maundy Thursday celebrations.

"I am delighted that some of the people who make such a great contribution to our city are receiving this prestigious award from Her Majesty."

The Queen has only missed four Maundy Thursday ceremonies since coming to the throne in 1952.

BBC Liverpool
Information and features on the BBC's Liverpool website

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Joseph Mallord William Turner 1775-1851

The Goddess of Discord Choosing the Apple of Contention in the Garden of the Hesperides exhibited 1806

Oil on canvas
support: 1553 x 2184 mm
painting

Bequeathed by the artist 1856

N00477
The Hesperides were the three daughters of Hesperus, the evening star. They kept watch over a tree of golden apples in a garden on the slopes of Mount Atlas. Here, the goddess Discord chooses the apple that will eventually lead to the Trojan war. Paris offered the apple to the goddess Aphrodite who, in return, offered him the most beautiful woman in the world: the Greek Queen, Helen.

The classical grandeur of this landscape is based on the work of the seventeenth-century French artist, Nicolas Poussin. Its background reflects Turner's experience of the Alps in 1802
(From the display caption February 2004)

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DNA Molecule - Two Views
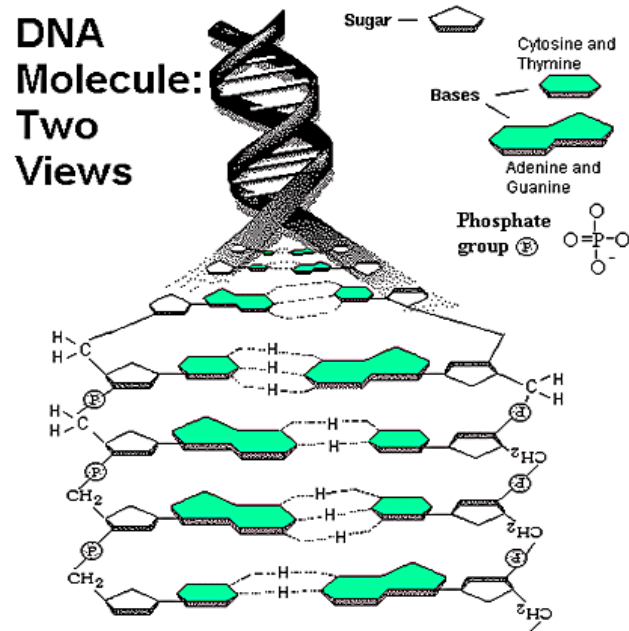
DNA Molecule: Two Views

Sugar —

Cytosine and Thymine

Bases

Adenine and Guanine

Phosphate group ℗

DNA Molecule - Two Views

Legend:

The double helix of the DNA is shown along with details of how the bases, sugars and phosphates connect to form the structure of the molecule.

DNA is a double-stranded molecule twisted into a helix (think of a spiral staircase). Each spiraling strand, comprised of a sugar-phosphate backbone and attached bases, is connected to a complementary strand by non-covalent hydrogen bonding between paired bases. The bases are adenine (A), thymine (T), cytosine (C) and guanine (G).

A and T are connected by two hydrogen bonds. G and C are connected by three hydrogen bonds.

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China sounds alarm on Aids

China's government has called for an increased effort to stop the spread of HIV/Aids, warning of severe punishment for any attempt at a cover-up.

Yu Daguan, an Aids sufferer in Dongguan village, in China's central Henan province

China hid a blood scandal in the 90s which infected entire villages

Health Minister Wu Yi told officials the epidemic was at a critical point where it could spread from high-risk groups to the wider public.

China admits to having more than 800,000 cases of HIV/Aids, but experts say the real figure could be higher.

The UN believes at least 10 million Chinese could be HIV positive by 2010.

"We can completely contain the momentum if we take it seriously. Otherwise, we will lose this best, fleeting opportunity," Ms Wu told regional health officials at a conference on HIV/Aids in Beijing.
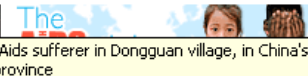
"It must be reported timely and faithfully. And any people who intend to hide the epidemic should take responsibility and will be severely punished," the China Daily quoted the minister as saying.

This emphasis on openness suggests China has learned lessons from the Sars (Severe Acute Respiratory Syndrome) crisis it suffered last year, which was worsened by an initial attempt by the authorities to suppress news of the disease, preventing adequate prevention measures.

The majority of Chinese still understand little about Aids

China also announced on Thursday the establishment of its first formal research centre on Aids, in Shanghai.

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Baghdad stunned by hotel attack

Rescuers in Baghdad have given up the search for survivors in the rubble left by a massive blast which killed at least 17 people, most of them Iraqis.

The explosion on Wednesday night wrecked the small Mount Lebanon hotel and nearby houses in the city centre.

The US military says a 450kg car bomb packed with artillery ordnance killed at least 17 people and injured 45.

On Thursday, three people also died in an attack on staff at a US-funded TV station in Baquba, north of Baghdad.

US officials say the hotel attack, in the busy Karrada district, was intended to cause maximum casualties and bore the hallmarks of an al-Qaeda-related group.

One Briton was killed, and another injured, the UK government said.

US officials initially put the death toll as high as 27, but later revised it downwards. Iraqi officials said the toll was as low as six.

Hours after the blast, a mortar attack on a US logistics base north of Baghdad killed two soldiers and injured six.

'Friendly' hotel

Most of the victims of the hotel bombing were Iraqis living

The blast scene

The hotel would have been a soft target for bombers

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The BBC's Paul Wood
"...ble were killed as they were sitting down to dinner"

▶ VIDEO

AFTER SADDAM

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US troops face longer Iraq stay

US Defence Secretary Donald Rumsfeld says some "seasoned" US troops in Iraq might be kept there longer than planned to deal with the growing violence.

Insurgents in Falluja

Accounts vary about casualties in Falluja

The troops have not lost control of the security situation, despite a recent upsurge in fighting, Mr Rumsfeld said.

The clashes were the work of a few "thugs, gangs and terrorists", he said.

In the latest reported violence, US troops were involved in clashes with both Sunni and Shia insurgents in the north and west of the capital Baghdad.

Operations were also continuing in the Sunni city of Falluja west of the capital - a day after the US military bombed a compound housing a mosque.

▾Map locating recent clashes

Iraqi witnesses say about 40 Iraqis were killed in the strike, but US Central Command said only one "anti-coalition force member" had died and there were no civilian casualties.

It is not known if there were any deaths among the five casualties reported by the US military.

Several days of clashes have claimed the lives of well over 100 Iraqis and at least 30 coalition soldiers in what is being seen as the worst escalation of fighting since Baghdad fell to US-led forces a year ago.

> ❝ We will likely be managing the pace of the redeployments to allow those seasoned troops... to see the current situation through ❞

Donald Rumsfeld

▸ In pictures: Iraq in turmoil

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"Coalition forces are fighting ...ns on two fronts"
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▸ New 'al-Qaeda' warning on Iraq

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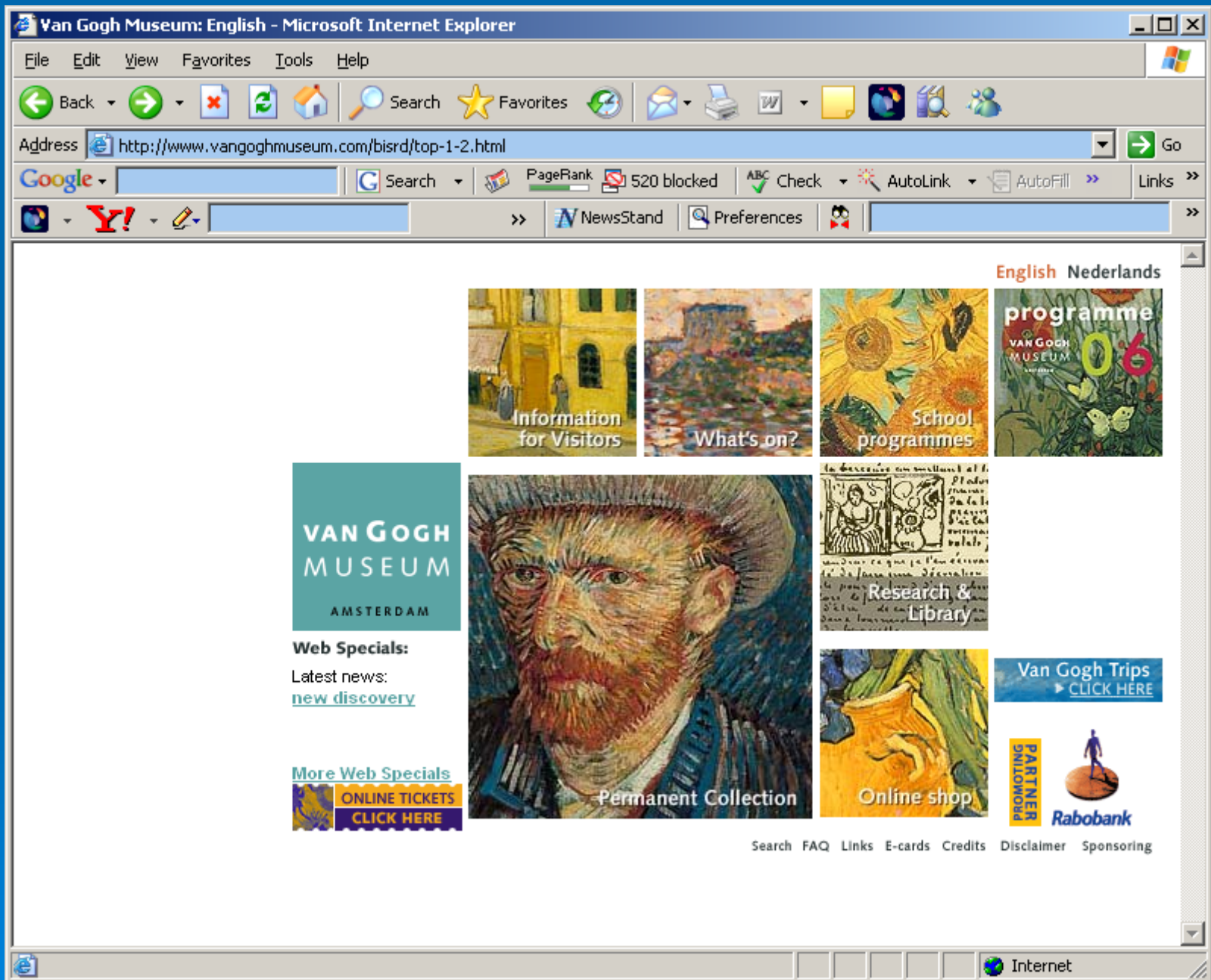▸ Can the violence be stopped?

▸ Full in-depth report

TOP MIDDLE EAST STORIES NOW
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Internet

Van Gogh Museum: Collection - Microsoft Internet Explorer

File   Edit   View   Favorites   Tools   Help

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Address http://www.vangoghmuseum.com/collection/catalog/alphaMart.asp?LANGID=0&SEL=1   Go

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VAN GOGH MUSEUM AMSTERDAM

Permanent collection

Home | Information for Visitors | What's On? | Permanent Collection | School programmes | Research & Library | Online Shop

Van Gogh   Other artists   Development   Van Gogh's Life   Virtual Tour

Organisation

This section of the website contains a representative selection of works by Van Gogh from the museum's collection. As in the museum this is divided chronologically into five periods that correspond with a different phase in the artist's life and work: the Netherlands, Paris, Arles, Saint-Rémy and Auvers-sur-Oise. It is also possible to search for paintings by title using the alphabetical list.

To accompany the exhibition _Van Gogh draughtsman: The masterpieces_ a number of drawings have been added to the selection of works. These can also be accessed via the relevant period.

Van Gogh Trips
► CLICK HERE

The Netherlands (1880-1885)   Arles (1888-1889)   Auvers-sur-Oise (1890)

Paris (1886-1888)   Saint-Rémy (1889-1890)

Alphabetical list

Internet

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Holland.

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Amsterdam > Museums

MUSEUMS

Rijksmuseum

The Rijksmuseum, Holland's treasure trove.▶

Van Gogh Museum

The only place in the world where you can see so many Van Gogh paintings.▶

Nieuwe Kerk

The New Church▶

Hermitage

Opened on February 28, 2004.▶

Stedelijk Museum of Modern Art

New, temporary location.▶

Anne Frank House

The Anne Frank House is a museum with a story.▶

The Rembrandt House Museum

Experience how Rembrandt use to live!▶

Jewish Historical Museum

A museum in the restored Ashkenazi Synagogue complex▶

Amsterdam Historical Museum

A museum with a large collection of Amsterdam art and artifacts.▶

Amstelkring Amsterdam

The top of a 17th-century merchant's house in the heart of Amsterdam's Red Light District conceals a secret.▶

Internet

Classifying Text-Image Relations

➢How can we tell which (image or text) is more important for successful communication?

➢What correspondence is there between the information conveyed by one and by the other?

➢What information, or other value, does one add to the other?

➢If we understand the content of one, then what can we infer about the content of the other?

➢What conventions are there for combining images and texts in particular genres of communication?

Proposed Classification Scheme
(Martinec and Salway 2005)

➢ In our classification of image-text relations we distinguish two independent kinds of relations:

- **Status relations** are to do with the relative importance of the text and the image, or the dependence of one on the other;

- **Logico-semantic** relations are to do with the functions that images and texts serve for one another.

➢ Different relations may hold between different parts of images and texts, i.e. image regions and text fragments.

➢ This scheme combines and extends ideas from Barthes (1977) and Halliday (1994)

Status Relations

- The relation between an image and a text is *equal* when:
  - both the image and the text are required for successful communication, in which case they are *equal-complementary*; **OR**
  - both the image and the text can be understood individually, in which case they are *equal-independent*.

- The relation between an image and a text is *unequal* when either the image or the text can be understood individually - that which cannot be understood individually is *subordinate.*

Logico-Semantic Relations

➢ A text *elaborates* the meaning of an image, and vice versa, by further specifying or describing it

➢ A text *extends* the meaning of an image, and vice versa, by adding new information

➢ A text *enhances* the meaning of an image, and vice versa, by qualifying it with reference to time, place and/or cause-effect

Features to Classify Relations?

➢ **Page layout and formatting**: relative size and position of image and text; font type and size; image border

➢ **Lexical references in text**: for example, 'This picture shows…'; 'See Figure 1'; 'on the left'; 'is shown by'

➢ **Grammatical characteristics of the text**: tense – past / present; quantification – single / many; full sentences or short phrases

➢ **Modality of images**: a scale from realistic to abstract, or from photographic to graphic

➢ **Framing of images**: for example, one centred subject, or no particular subject

Classifying Text-Image Relations

Hypothesis

"Text-image relations in an arbitrary multimedia document can be classified on the basis of low-level media features"

Plans for CLASTIC project

Aim

➢ Test our hypothesis

➔ A general classification scheme of text-image relations so that for an arbitrary combination it is possible to classify automatically the relations holding between the verbal and visual components

- systematic description of text-image relations, with formal realisations of each relation based on image features, linguistic features, and page features
- relations defined so information about them can be leveraged to guide the analysis and structuring of multimedia documents

Plans for CLASTIC project

Approach

➢ Create a corpus of web pages representative of text-image combinations on the web, with an associated database of low level media features and text-image relations; and complementary corpora of digitised printed material, video data and multimedia presentations

➢ Develop the classification scheme by investigating the correlation between low-level media features and text-image relations in the corpora

➢ Develop a software component to classify text-image relations for arbitrary multimedia documents

➢ Evaluate in a range of multimedia knowledge management applications

Reprise

Retrieve and browse video data on the basis of narrative structures

➔ extract representations of narrative structures in films from collateral texts

Develop an understanding of how the 'whole' of a multimedia document conveys meaning beyond the sum of its parts

➔ classify and make use of the relations between verbal and visual media types in systems that analyse and generate multimedia documents

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Acknowledgements

EPSRC GR/R67194/01, TIWO: Television in Words

- TIWO Project Students
  - Mike Graham
  - Elia Tomadaki
  - Andrew Vassiliou
  - Yan Xu
- TIWO Project Partners
  - BBC Broadcast, BBC Archive, RNIB, ITFC, Softel

Collaborators on Text-Image Relations

- Radan Martinec (University of the Arts, London)
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Retrieving the Visual via the Verbal

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