

BBC Nov 30th 2009

Simon Factor – Moving Media: Video Digitisation Studios

Paul Ferguson – Clarity / Centre for Digital Video Processing



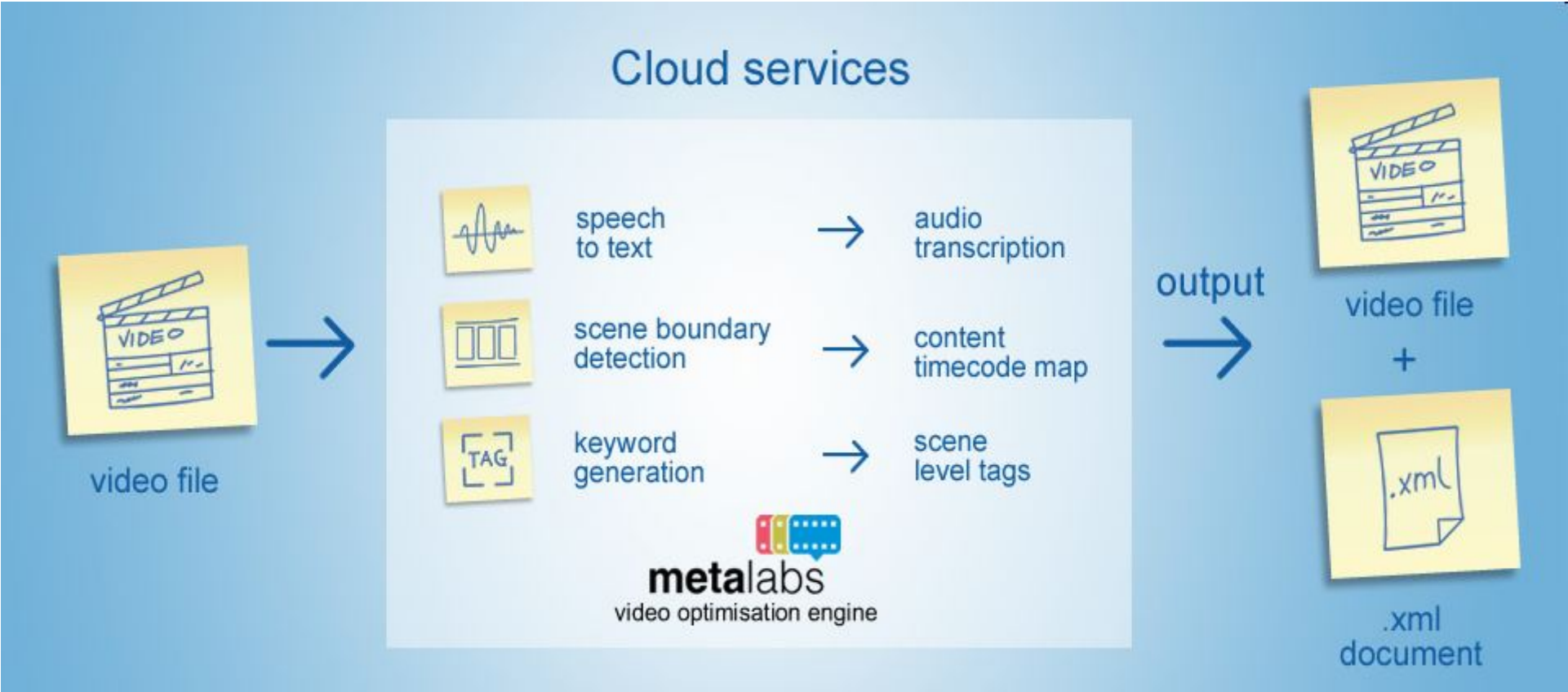
Mission:

'To provide a set of cloud based services that enrich digital video assets, through the generation of temporal and structural metadata.'

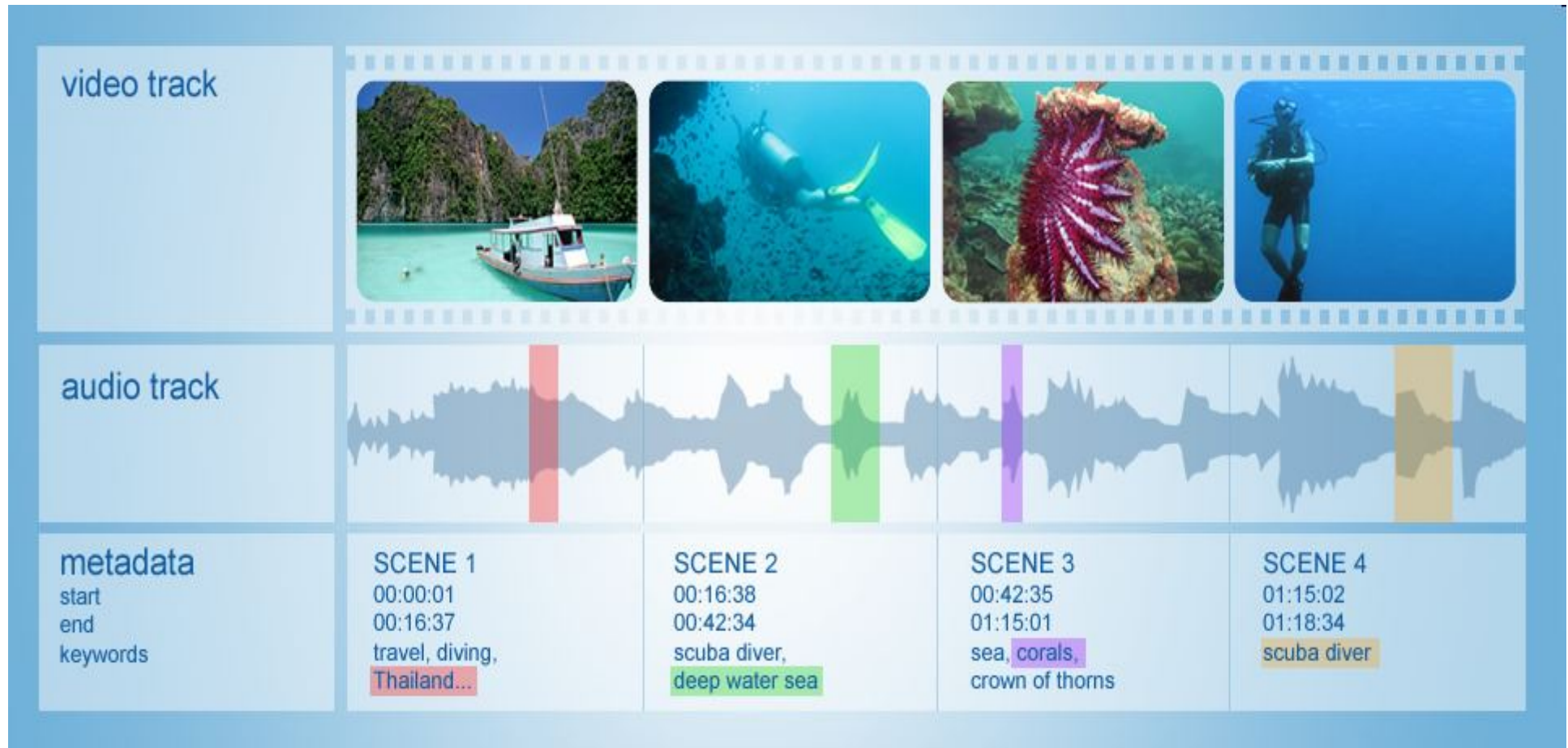
Collaboration between Moving Media and CLARITY

Funded through the NDRC (National Digital Research Centre)
Translational Research Programme

Map:

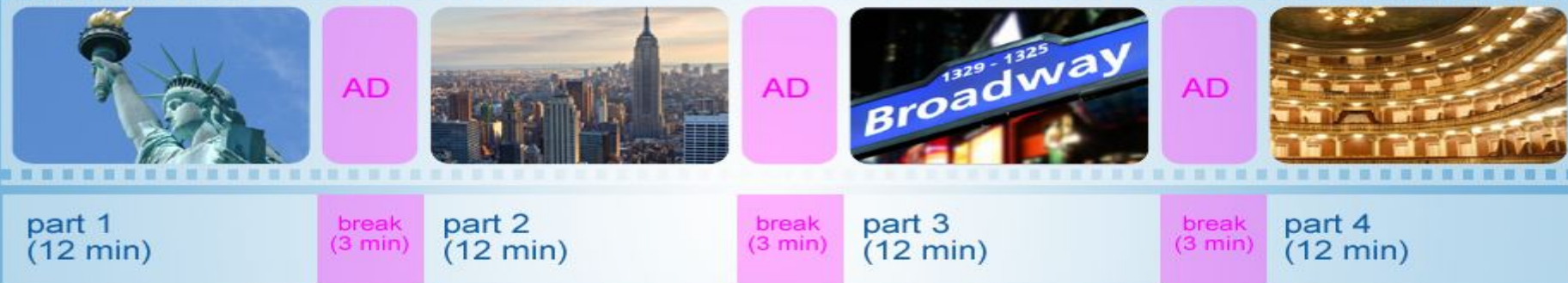


Video Metadata Generation

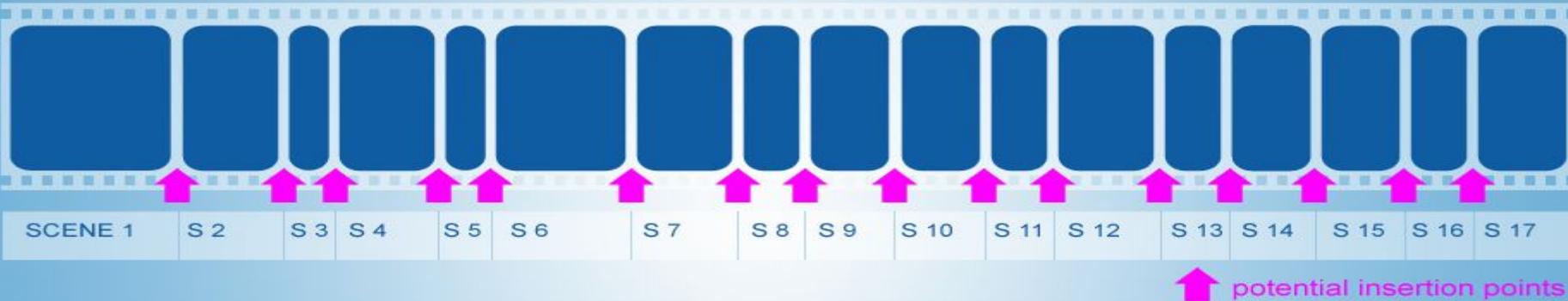


Online v Broadcast

traditional programme hour - linear broadcast model



on demand programme hour - nonlinear streaming model

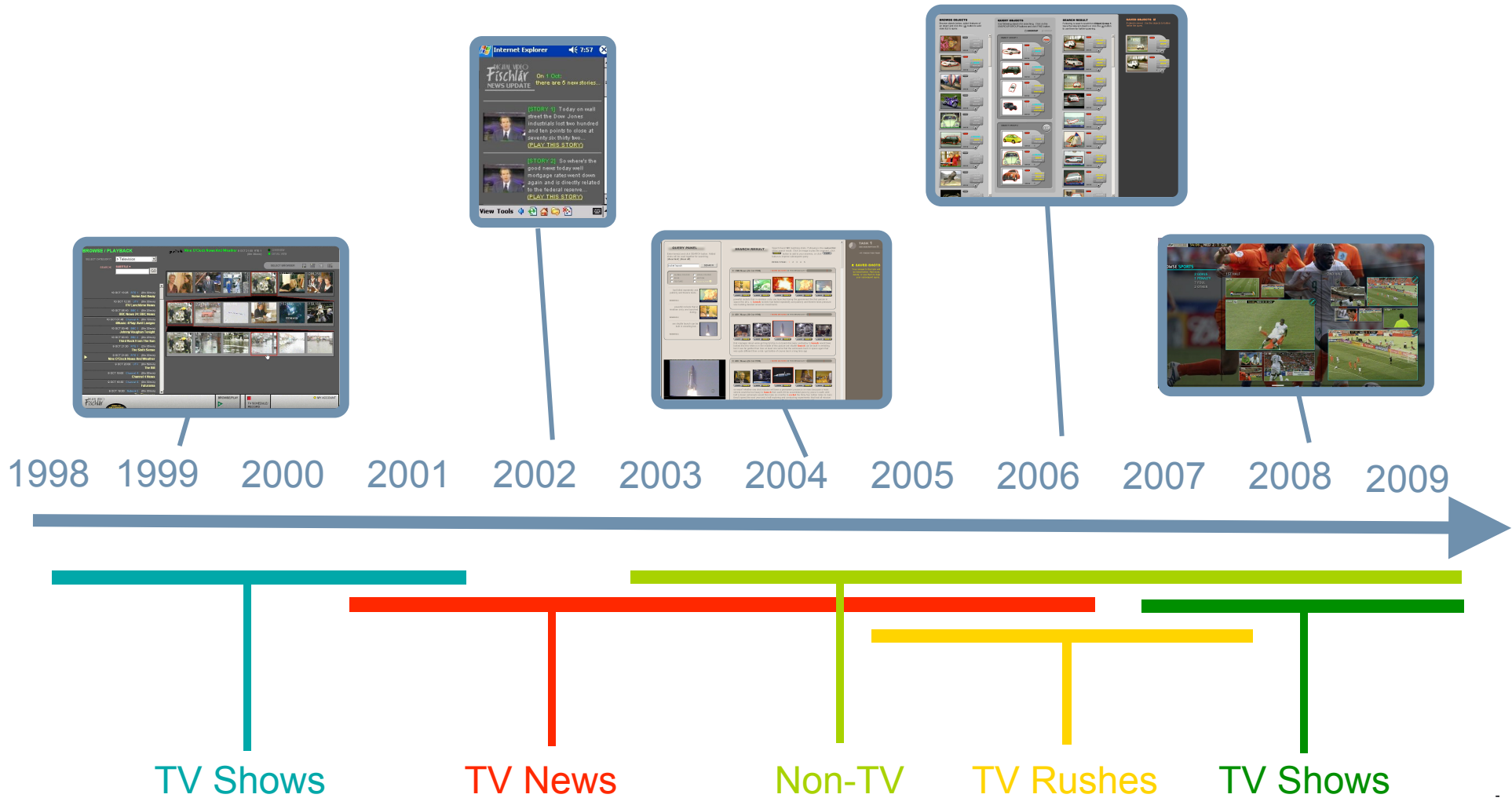




Centre for Digital Video Processing

- 5 Faculty, 14 PostDoc, 3 RA, 20 PhD
- Digital multimedia analysis & organisation
 - Video : TV, News, Educational, CCTV, iTV
- Personal Media Management
 - Human Digital Memories
 - Personal Photo Management
- Sensor Networks & Sensor Web Technologies
- Text IR / Search Engines

Eleven Years of Video Search



Físchlár-TV

- In operation for about four years in DCU:
 - Over 2,500 registered users.
- Supported recording, browsing, and playback of digital video, from eight TV channels.
 - Record video to a shared library.
 - Restricted access to within the University.
- At transmission time, we capture video, detect shots & keyframes and add videos to library.

BROWSE / PLAYBACK

SELECT CATEGORY: > Television

SEARCH: SUBTITLE
GO

OVERVIEW
DETAIL VIEW

SELECT BROWSER

- 4 NOV 21:30 RTE 1 (0hr 55min)
CSI: Crime Scene Investigation
- 4 NOV 21:00 Network 2 (0hr 30min)
Father Ted
- ▶ 4 NOV 20:30 Network 2 (0hr 30min)
Friends
- 4 NOV 20:00 Network 2 (0hr 30min)
Third Rock From The Sun
- 4 NOV 19:55 Channel 4 (0hr 05min)
Advice From The Young At Heart
- 4 NOV 18:00 Channel 4 (0hr 30min)
Friends
- 4 NOV 17:05 UTV (0hr 25min)
Popstars: The Rivals Extra
- 4 NOV 16:20 RTE 1 (0hr 35min)
EastEnders
- 4 NOV 15:00 Network 2 (0hr 20min)
Rugrats
- 4 NOV 14:15 Network 2 (0hr 20min)
Bob The Builder
- 4 NOV 13:50 Network 2 (0hr 25min)
Barney And Friends
- 4 NOV 12:55 Network 2 (0hr 30min)
Teletubbies
- 4 NOV 12:05 Network 2 (0hr 05min)



But this little old lady lives for my career. When they dumped me off 'Days of Our Lives' she almost died. That's not good. You're not smiling, everybody smile! Why don't you just tell her what happened, its not your fault. If we keep talking this way aren't we going to freak her out soon?



SPEAKS ITALIAN Soon, I'm going to be on soon. There I am! No, Sam Waterstone. No, that's me. No, Sam Waterstone, Crime Misdemeanor, Capricorn One. She doesn't know hello but she knows Capricorn One.



Pheobe, I have to have those earrings, we're leaving as soon... as the show is over. But I already gave them to you. No you didn't. Alright, I already didn't give them back to you, that's what I said!

Searching for Content

- Browsing is time consuming and people are used to “Googling” for content, so we should support search.
- Text search
 - Effective for WWW search engines
 - Users are used to this
 - Many options for gathering textual evidence
 - Speech Recognition
 - Closed Caption text
 - OCR text
 - Manual annotations (e.g. EPG or community annotations)
- Automatically linking of content, e.g. news stories

Físchlár-News

Online Video Archive of Daily RTE1 9 o'clock News

Check the recommended news for you **RECOMMENDED**

SEARCH:

Query term(s): **Bremer**
Search found: **5 news stories**

Search found following stories which contain your query term(s). Browse and play the stories or look at other stories on the day following stories belong. To receive recommended stories, please indicate whether you like the news stories or not, using thumbs icons.

Search Result: 5 stories

September 2003

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

August 2003

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

July 2003

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19



News Story (duration: 00:02:24) (13 Jul 2003)
The first Iraqi council meets since Saddam's overthrow ... (PLAY THIS STORY)



News Story (duration: 00:02:01) (22 May 2003)
UN Security Council has voted by 14:0 to lift sanctions on Iraq and to recognise United States and Britain as... (PLAY THIS STORY)



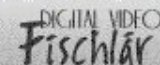
News Story (duration: 00:01:53) (5 Jul 2003)
The chief US administrator in Iraq, Paul Bremer, has condemned an attack in the west of the country which killed seven recruits to a US-backed police force... (PLAY THIS STORY)



News Story (duration: 00:02:22) (23 Aug 2003)
At least nine people have been killed and more than 10 wounded in clashes between Kurds and Turkmen in Northern Iraq... (PLAY THIS STORY)



News Story (duration: 00:02:10) (17 Oct 2003)
The US House of Representatives has approved President Bush's request for \$87bn in new spending for military operations and reconstruction efforts... (PLAY THIS STORY)



EMAIL US WITH COMMENTS

MY ACCOUNT

Visual Search

- More processor intensive
- Automatically extract features from each keyframe/shot/...
 - Image/Video low-level features
 - Colour, shape, texture, object/camera motion etc...
 - Derived Attributes
 - People, known faces,
 - Location (indoor, outdoor, etc...)
 - Objects (cars, boats, airplanes, etc...)
 - Events (explosions, crash, etc...)
- TRECVID founded in 2003 as an evaluation workshop for content-based video retrieval systems
 - Jointly founded & co-ordinated (annually) by Alan Smeaton (DCU).

QUERY PANEL

Enter term(s) and click SEARCH button. Added shots will be used together for searching.
[clear text] [clear all]

rocket launch SEARCH

- GLOBAL COLOUR LOCAL COLOUR
 EDGE MOTION
 TEXTURE FACE FILTER

had failed repeatedly and publicly and there're tests...



REMOVE X

powerful rockets that in nineteen sixty one launched during...



REMOVE X

are shuttle launch can be built in wrestling but...



REMOVE X



SEARCH RESULT

Search found 250 matching shots. Following is the ranked list of the search result. Click an image to play the segment, click **SAVE** button to add to your answers, or click **QUERY** button to improve subsequent query.

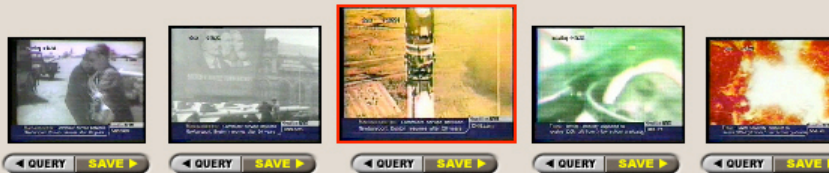
RESULT PAGE: 1 2 3 4 5

1: ABC News (30 Oct 1998) > MORE MATCHES IN THIS BROADCAST



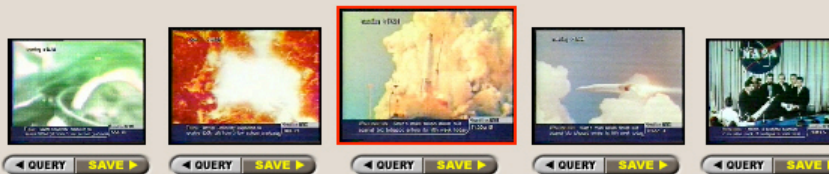
that manages about we've got big he'd be in on board discovery yesterday to **launch** would have looked like this when is in the middle of this picture are shuttle **launch** can be built in wrestling but it was far gentler than lives at least one we've that the astronauts back in space again that was quite different than a ride i got before of course back a long time ago

2: CNN News (26 Oct 1998) > MORE MATCHES IN THIS BROADCAST



those were the coldest years of the cold war the soviet military arsenal included powerful rockets that in nineteen sixty one launched during the government the first person in space this all u. s. **launch** rockets

3: CNN News (26 Oct 1998) > MORE MATCHES IN THIS BROADCAST



the government the first person in space this all u. s. **launch** rockets had failed repeatedly and publicly and there're tests pressure was building devoted american investments these are the past there have been

4: CNN News (26 Oct 1998) > MORE MATCHES IN THIS BROADCAST

TASK 1

SEE DESCRIPTION

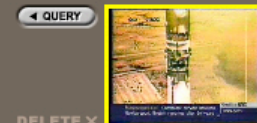
→ FINISH THIS TASK

SAVED SHOTS

You saved 2 shots, shown below - these are your **answers** to the current task. Add more, delete, or use them for subsequent query.



DELETE X



DELETE X

Samsung Interactive TV

- Content-based searching of TV content
 - Using low-level features
 - EPG text
 - Linking to recorded content & YouTube
- Social interaction between “buddies”
- Automatic sports summarisation
- Automatic news segmentation

RTE NEWS



BROWSE NEWS 12 STORIES

02:02 (1m 25s)

03:27 (2m 30s)

05:57 (1m 41s)

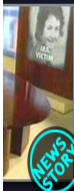
07:38 (2m 15s)

09:53 (54s)

10:47 (1m 15s)

12:02 (1m 21s)

13:23



Sports Event Detection

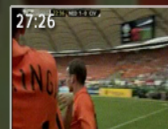
- Detecting events in sports and summarising sports is useful when recording large archives of sports content
- Exploit production techniques in sports broadcasting
 - E.g. a goal in soccer
 - Player close up, crowd excitement, end-line visible, ...
 - Develop detectors for these visual & aural events
 - Can be applied in a domain such as end-to-end field sports
 - Other sports types would need different detectors

itv SPORT 54:06 NED 2-1 CIV

BROWSE SPORTS

2 GOALS
1 PENALTY
7 FOUL
2 OTHER

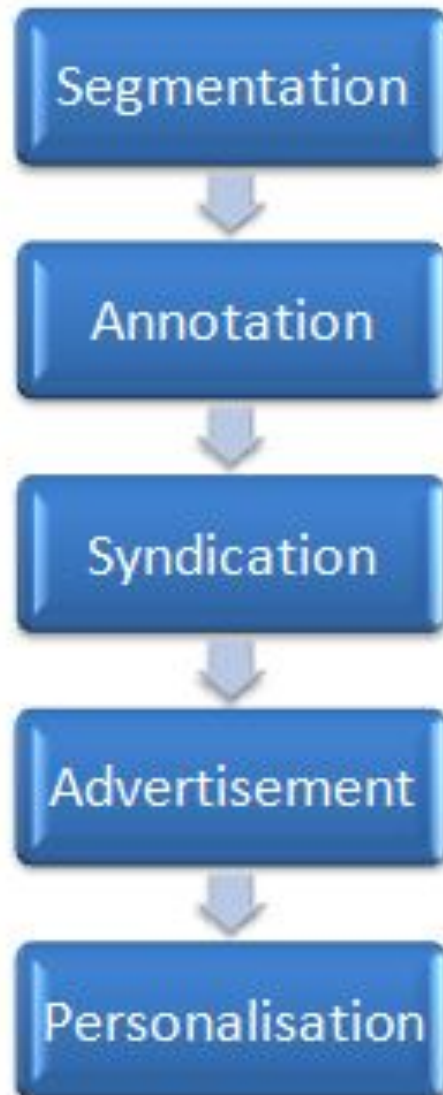
1ST HALF



2ND HALF



MetaLabs – Service Modules:



Automatically segment video content into a set of meaningful segments, which includes the identification of important breakpoints in the content for targeted advertising

An annotation engine that, using automatic state-of-the-art visual and aural processing technologies, automatically adds value by generating semantically meaningful high quality XML format annotations

Push the video and metadata to identified major search engines and online video platforms

Target advertisements at relevant video segments based upon 'ad-centric' keywords

Optimise advertisements or content recommendations based on user interests

Stakeholder Benefits:

For the Content Owner:

- Higher value product – Video + Metadata
- Greater visibility for content in search engines/portals

For the Advertiser

- Optimum placement of midroll advertising messages
- More targeted advertising linked to scene level keywords

For the Publisher

- Increased CPM Rates
- Wider inventory of advertising products

For the Audience

- More granular and relevant search results
- Custom programme streams/mashups

Client Case Study:



Babelgum are an online video destination site – they license premium content and generate income from online video advertising. Moving Media have provided video encoding services to the company since start up in Jan 2007. In 2008 were asked to provide a solution to support midroll advertising placement.

- Pilot Project began in February 2009
- Client Requirement – Map 6000 video elements for midroll ad insertion
- Two stage process – log file analysis for keyframe info – operator verified
- Babelgum platform now supports midroll advertising

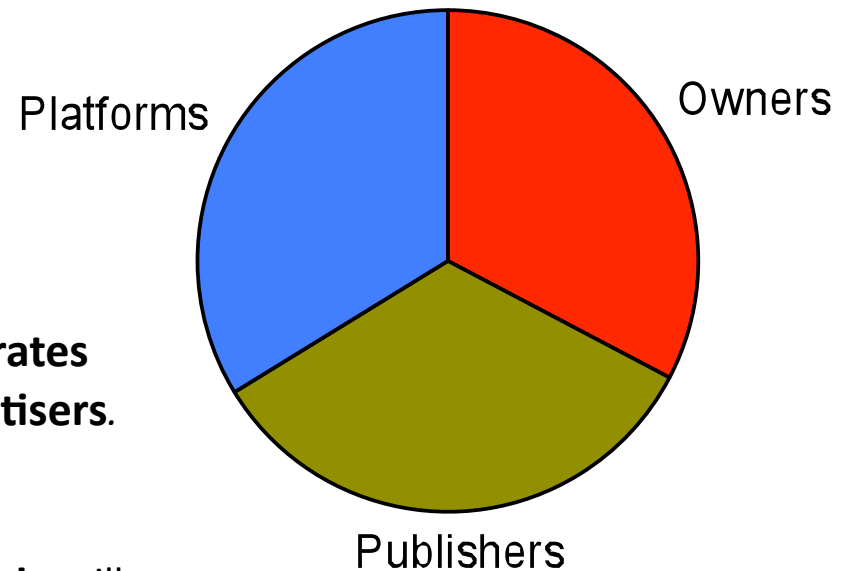
Commercial Considerations

Worldwide online video revenue is expected to eclipse **US\$4.5 billion** by **2012**, up from \$1.2 billion in 2008, by this time **90%** of US households will have **broadband** and **94%** of these users will **consume online video** products (InStat)

In contrast, **TV advertising** investment fell **4.2%** from \$69.8 to \$66.9B in 2008/9 (eMarketer).

Temporal metadata can be leveraged to **increase the CPM rates** achieved by publishers and the **targeting** available to **advertisers**.

For archive preservation projects **temporal metadata** will deliver **RoI** in terms of both **revenue** (content re-use/licensing) and **social impact** (education/culture).





Founded in 2003

Specialise in high quality encoding of video tape for broadcast, archive and internet



Broadcasting Commission of Ireland
Coimisiún Craolacháin na hÉireann



The Cousteau Society

gettyimages®



ireland.com
THE IRISH TIMES

