Mapping World Events

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GI4DM, 2005
Basic Goals

- Fusion of media reports & Geospatial data for situation and crisis management.
- Early warning systems & Trend analysis
- Based on:
  - Automatic Internet news monitoring (EMM)
- Users: RELEX, ECHO, EC Crisis Rooms
“State of the World”

**Physical**
- Thermodynamic systems have a state $S(T,V,P,...)$. Hide molecular complexity.
- Measured by Temp, Press, Entropy…
- Weather is rather more complex – chaotic
- Weather Maps

**Social**
- Social systems have a “state” (war, peace, growth, famine etc.) Hide complex issues.
- Measured by news reporting - indicators
- Real life is also complex even chaotic
- News Maps
Analogy with the weather

NEWS

Weather

select THEME: Conflict

% outside

- 0% 20% 40% 60% 80% 100%

Central-click to ZOOM IN, Central-slide to ZOOM OUT; Alt-click to PAN;
Europe Media Monitor (EMM)

- Media Monitoring System for European Union
- 700 web sites around the world every 15 mins
- 15 news agencies
- 30 world languages
- Site updates every 10 minutes
- 25,000 articles per day
- 400 subject Alerts defined by keyword lists
- EC specific but has good world coverage
**EMM Alert Definitions**

Tunable subject Alert definitions detect articles & Send SMS/email alerts

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Boolean Combinations

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Word Filters: Σ weight > threshold
Analysis Main Strands

1. Real-time Breaking News Detection
2. Article Clustering & Geolocation

Statistical Analysis

EMM
RSS based
1. Real Time Breaking News Detection

- Headlines appear with capitalised Nouns.
- Identify new Topics appearing above the background

Signal level depends on $\frac{dn}{dt}$
Breaking News

April 20, 2004
Assign keywords, geocoding

- Extract semantic features from plain text
- Compare frequency of word in one article to its frequency in a “big” corpus
- Geocoding (geographical place recognition), using a multi-lingual database of about 80,000 places in the world. Disambiguation needed (14 Paris’)

More Than 20 Dead In Bali

Blast site (Reuters) More Than 20 Dead In Bali More than 20 people have been killed and up to 120 others wounded in a series of explosions on Indonesia’s resort island of Bali. There were three blasts at two nightclubs, one of which was caused by a homemade bomb, police officials said. One officer said they had occurred simultaneously, one of them not far from the US consulate on Bali. "Lightly wounded" At this stage we have 14 people dead. There are around 120 badly and lightly wounded," Yatim Suyatmo, police spokesman for Bali, said. One local photographer said he had seen up to 15 cars wrecked by one of the blasts, with a number of people still inside the club. Police said it was too early to say if all the blasts had been caused by bombs. "But they come at a time of growing security concerns in the world's most populous Muslim nation in the wake of recent terror threats. Explosions Police said all the explosions were concentrated in the Kuta Beach district - an area popular with foreign tourists. An official at a local hospital said the wounded included Americans and Australians. Eyewitnesses spoke of chaos near one of the blasts at the Sari nightclub near the famous Kuta beach strip. One witness said windows on shops had been blown out up to 500 metres away from the Sari nightclub, and that the blast had been heard many miles away.

blasts, bali, wounded, explosions, sari, lightly, kuta, nightclub
Building a cluster tree

- Every night, for each language
- Take all articles (7000 for English)
- Use keywords and countries as features
- Algorithm:
  - Find pair of texts that are most similar
  - Group them in one cluster, repeat the operation until only one cluster remains
Geocoded news for 6th September 2004

- Approach is to build into EMM operations logging of statistics, themes and countries.
- 24/7 live monitoring since July 2003
Themes

- Themes are defined as Alerts which apply globally:
  - Conflict
  - Food Security and Food Aid
  - Terrorism
  - Humantarian Aid
  - Security
  - Natural Disasters
  - Man Made Disasters
  - Ecology

Countries

- Alert categories are defined for all world countries. Name of country in all languages + capitols (if unique).
- 220 countries
EMM Alert system logs statistics since July 2003.

Alert System keeps hourly statistics in XML files for each alert AND for (theme,country) coincidences.

Alert files also record all categories triggered for each article, source countries, languages etc.

XML-API to select coincidences

We then define sets of articles S(theme,country) for any hour/day/month
BAM Earthquake Detail

Daily Alert Statistics from 2003-11-01 to 2004-01-30

- HumanitarianAid
- Iran
- NaturalDisasters

Max. Value: 1409
Thematic Indicators

Thematic Indicators derived from EMM Alert Statistics

\[ I_{cj} = \frac{N_{cj}}{N_c} \]
where \( N_{cj} \) = No. articles for Combination of country C and theme j.
and \( N_c \) = total <count> for country C.

\[ I_{jc} = \frac{N_{cj}}{N_j} \]
where \( N_{cj} \) = article <count> for Combination of country C and theme j.
and \( N_j \) = total <count> for theme j.

\[ I_{cj}(t, \Delta T) = \text{Indicator measured at time } t \text{ aggregated over time period } \Delta T \]
Time series studies of country indicators

State of the World - indicator theme -

Coup d'état

select COUNTRY

Argentina
Brazil
Chile
Colombia
Ecuador
Falkland Islands
French Guiana
Guyana
Peru
South Georgia
Suriname
Uruguay
Venezuela

West Africa
Benin
Burkina Faso
Cape Verde
Gambia
Ghana
Guinea
Guinea-Bissau
Ivory Coast
Liberia
Mal
Mauritania
Niger
Nigeria
Sierra Leone
Togo
Terrorist Attacks in Spain

State of the World
- averaged by theme -

Period of: 1 year
Group by: 1 day 3 days week

Select Theme: Conflict

Country: Spain
Theme: Conflict

% articles:
>18
16...19
14...16
12...14
10...12
8...10
6...8
4...6
2...4
0...2

breaking news | country watch | statistics | indicators | latest news | advanced search
News Maps

- **Basic Idea**
  - World Map of country indicators at one time
  - Animations of events show evolution over time

- **Technology**
  - SVG – Scalable Vector Graphics & FLASH
  - Simple XSLT transform
  - Live 24/7 operations, Live News Maps
Case Study – Forgotten Crises

- While the world’s attention focuses on crises in Iraq and Middle East, those in Africa and Asia are “forgotten”.
- ECHO, UN need to identify these forgotten conflicts to provide humanitarian aid to avert major tragedies like Rwanda.
- Forgotten crises are countries with high internal conflict but low media coverage.
Aug2003: Forgotten Crises – $I_{\text{Conflict}}$

Selection for countries with High internal conflict indicator BUT low global conflict Indicator
Study: Information synthesis for RELEX

Provide desk officers with concise clear overviews of current situation in any country of the world. Integrate news, Maps & structural data.

News hotspots for themes
Hourly Live News Maps

Countries more in the news
Compares to 5 Day average.

Countries more mentioned in Conflict articles than expected
News on each country of 20041226 compared to the average of the last 10 days
Effect of Tsunami  26th Dec 2004

News on Natural Disasters for each country on 20041226
Early Warning Monitor

49 Articles for 'mining'

Thu, Feb 10, 05

- First funerals of Kemerovo mine blast victims set for Feb 11 03:12 CET interface-en, Translate : nl/fr/de/el/pl es
KEMEROVO, Feb 10 (Reuters) - The first funerals of those killed by the February 9 methane blast in the Yessentukays coal mine in the Kemerovo region will be conducted on Friday, February 11.

- Siberia Coal Mine Blast Kills 22 People 04:52 CET guardian, Translate : nl/fr/de/el/pl es
Siberia Coal Mine Blast Kills 22 People Thursday February 10, 2005 3:46 AM By MIKE ECHEL Associated Press Writer MOSCOW (AP) - An explosion ripped through a mine in a coal-rich region of Siberia on Wednesday, killing at least 22 workers and three missing.

- Mine explosion kills 22 in industry plagued by safety violations 03:23 CET glasgowerald, Translate : nl/fr/de/el/pl es
An explosion swept through a mine in the Kuzbass region of Siberia yesterday, killing at least 22 workers and leaving four missing in the latest accident in an industry plagued by disputed mines, aging equipment and safety violations. The blast occurred.

- Russian coal mine blast kills 21 01:15 CET bbb, Translate : nl/fr/de/el/pl es
A methane explosion in a coal mine in southern Siberia has killed at least 21 people, Russian emergency services say. The blast happened as miners and rescue workers battled to contain a fire that had broken out on Tuesday in one of the mine shafts. All
Summary

- News statistics and visualisation
  - Breaking News detection & visualisation
  - Thematic Indicators, Trends and Statistics
  - News Clustering and Geolocation of Stories
  - News Maps, Crisis warning and analysis

- Public URLs
  - [http://press.jrc.it](http://press.jrc.it) (NewsBrief)
  - [http://press.jrc.it/NewsExplorer](http://press.jrc.it/NewsExplorer) (News Explorer)
Sikhs 4:37:00 PM CET

Theatre halts play after protest
NEWScomAU 4:37:00 PM CET

From correspondents in London December 21, 2004 A THEATRE in the central British city of Birmingham decided today to halt performances of a controversial play after a weekend protest by resident Sikhs offended by the production.

Play axed after Sikh protests
guardian 4:34:00 PM CET

Sarah Left Monday December 20, 2004 The Birmingham theatre attacked this weekend in a violent protest by Sikhs today announced it was ending the run of a play that depicts murder and rape in a Sikh temple. Stuart Rogers, the executive director of the Birmingham........

Bush 6:13:00 PM CET

Bush and Putin to hold February summit
RT 6:13:00 PM CET

At a White House news conference, President Bush acknowledged policy disagreements with Moscow - including over policy in Iraq - but insisted that the overall relationship between the two countries remained positive. As you know, Vladimir Putin and I have a good relationship. Starting with our meeting....

Bush Looks At Road Ahead
CBSnews 6:09:00 PM CET

, who is facing rising criticism from Democrats and Republicans alike. Mr. Bush said Rumsfeld was doing a "very fine job" in challenging times. The president also said Bernard Kerik did the right thing in removing his name from consideration as Secretary of Homeland Security. This was Mr....

Najaf 4:32:00 PM CET

Ayatollah Ali Khamenei: Israel, U.S. Rigging Iraq Election
iranpress 4:32:00 PM CET

TEHRAN -- Israeli and U.S. agents were behind bombings in Iraq's Shi'ite holy cities of Kerbala and Najaf, Iran's Supreme Leader said Monday, accusing Tehran's arch-foes of trying to rig Iraq's elections for a US-run administration.

Augusto Pinochet 5:35:00 PM CET

Chilean Court Upholds Pinochet Indictment
guardian 5:35:00 PM CET

Monday December 20, 2004 4:17 PM AP
Photo XRC105 SANTIAGO, Chile (AP) - An appeals court Monday upheld the indictment and house arrest of former dictator Gen.
Wednesday, October 27, 2004

Barroso backs down over EU vote

A vote to approve the new European Commission has been delayed after the incoming president withdrew his proposed line-up of commissioners. Jose Manuel Barroso said more time was needed to choose a ... (photo: EC)