Multimedia Understanding through Semantics, Computation & Learning

NOE FP6-5077-52
MUSCLE Overview

- **Strategic Objective:**
  Semantic-based Knowledge Systems

- **Consortium:**
  - Partnership of 42 research labs and institutes
  - Coordination:
    - Administrative: B. Le Dantec, ERCIM (bruno.ledantec@ercim.org)
    - Scientific: E. Pauwels, CWI (eric.pauwels@cwi.nl)

- **Duration:** March 2004 – Feb 2008

- **Budget:** 6.9 MEuro
MUSCLE Objectives

1. **Scientific:** Harnessing machine learning to automate semantic-based multimedia retrieval:
   - Creation of semantically rich metadata
   - Computer-assisted inference based on them

2. **Integration:** Establish durable integration between key scientific and industrial players;

3. **Dissemination:** Through benchmarking, dissemination and training stimulate uptake by end-users;
1. MUSCLE Scientific Objectives

- **Goal:** Efficient datamining of MMDB based on semantics and multimedia understanding;

- **Means:**
  - Improve effectiveness and robustness by combining different modalities (speech, text, audio, video);
  - **Automate** extraction of semantics through extensive use of machine learning and computational science;
  - Apply machine learning to improve human-computer interaction: moving from modelling to learning.
MUSCLE Scientific Ambition: Scientific Workpackages (1)

- **WP 5: Single Modality Processing:**
  - *Goal:* Improve performance of single modality processing (video, audio, text)

- **WP 6: Cross-Modal Integration:**
  - *Goal:* Improve robustness of meta-data extraction by combining different and complementary modalities

- **WP 7: Computation Intensive Methods:**
  - *Goal:* Harness the power of large scale statistical modelling and simulation for the exploration of multimedia databases
MUSCLE Scientific Ambition: Scientific Workpackages (2)

- **WP 8: Machine Learning for Multimedia Content:**
  - *Goal:* Apply and extend *Statistical Learning* techniques for the creation and interpretation of meta-data

- **WP 9: Representation and Communication of Data:**
  - *Goal:* Extend standards for multimedia (meta-)data

- **WP 10: HCI for Multimedia Retrieval:**
  - *Goal:* Facilitate natural interaction for MMDB

- **WP 11: Integration Projects: Grand Challenges**
2. Promoting Durable Integration

- Promoting mobility and facilitating Human Resources Management
- Network cohesion and integration stimulated by joint work towards two Integration Projects (“Grand Challenges”):
  1. Natural high-level interaction with MM databases
  2. Detecting humans and interpreting human behaviour in video
- Creation of a Virtual Lab
  - Through use of multimedia networking, facilitate easy and engaging access to people, ideas and data.
    - Exchange of software modules, multimedia preprint server, virtual meetings, tools for collaborative work, etc.
3. Dissemination

Towards research community:
- Creation and management of specialized databases (courseware, test-data, preprints, software tools)
- Management of SIG related to MUSCLE topics
- Training: Creation of 5 annual postdoc fellowships

Towards commercial and industrial partners
- Road maps, position papers and systematic benchmarking
- Creation of *Application Forum* to stimulate knowledge transfer between scientific and commercial parties
Contribution to EC Strategic Objectives and Expected Impact

- **Scientifically:**
  - Automatic and scaleable semantic annotation of multimedia content;
    - Generating robust semantic-rich metadata
    - Providing adaptive inference tools

- **Structurally:**
  - Network building and durable integration: especially between different research communities (video, audio, speech, text)
  - Dissemination towards target industries and end-users: Role as key-enabler for host of Semantic Web Technologies
Contact Information

- http://www.ercim.org/muscle
- http://www.cwi.nl/projects/muscle