

User-centered multimedia content personalization: a services composition based approach

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Agenda

- Contextualization
- Motivation
- Objective and contributions
- Research gaps and hypotheses
- Methodology
- Past and present work
- Future work
- Achievements
- Acknowledgments

Contextualization

- Digital television and the interaction with multimedia content
- User-producer role (YouTube, Facebook, etc.)
- The use of portable/mobile devices and the need of content adaptation & personalization
- Personalization: content selection, recommender systems, summarizations, etc.
- The use of semantic information to provide personalization services and the exploration of interaction information

Contextualization

- Interaction: authoring
 - Hierarchical
 - Usually employed by content providers
 - Essential for personalization tasks
 - Peer-level annotation
 - Done by any person
 - User is free to express him/herself in different ways

Motivation

- Semantic metadata creation
 - Hierarchical
 - Time-consuming and subjective
 - Peer-level
 - Enrichment
 - Provision of personalized services according to the interests of the same user who annotated
- Peer-level annotation challenges
 - Interaction can be done in different ways
 - Annotation does not follow a restrictive vocabulary

Objective and contributions

- Objective
 - Provision of personalized content based on high-level semantic information supported by peer-level annotations
- Contributions
 - Combine different techniques (or services) that explore particular interaction aspects
 - Isolate the unrestrictive vocabulary by adding a representation model for metadata extracted from interaction

Research gaps and hypotheses

- Research gaps
 - Lack of techniques that use collaborative work from different people to annotate content
 - The time-consuming efforts to author metadata
 - The content-centered approach which generalizes user's perceptions at visualization time
- Hypotheses
 - Using peer-level annotations may help personalization services by providing semantic information about the content and user's preferences

Methodology

- Research was developed in a chaotic way
- Now, experimental procedures focus on two pre-defined directions:
 - Metadata extraction techniques
 - Initial architecture

Methodology

- Metadata extraction techniques
 - Individual frame(s) or scene(s) chosen by the user to annotate
 - Low-level characteristics or presence/absence of specific objects into a frame or scene
 - Time spent to annotate into a frame or scene
 - Classification techniques to define which subject the user is more interested

Methodology

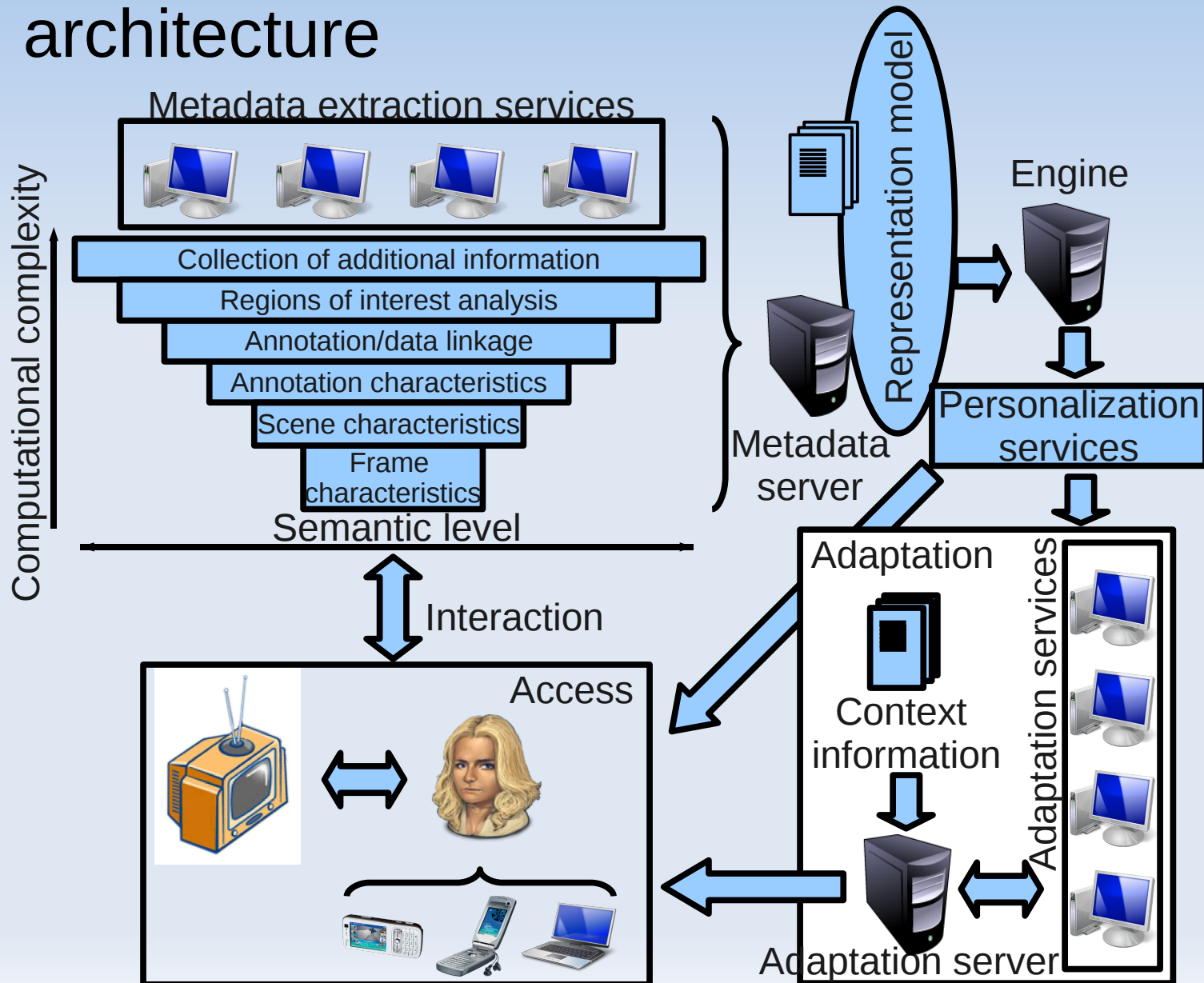
- Metadata extraction techniques
 - Annotation gestures and assistive segmentation
 - Handwriting characteristics, such as shape, intensity and speed
 - Object segmentation assistance by specifying regions of interests

Methodology

- Metadata extraction techniques
 - Content sharing among users, documents and interfaces
 - Sharing metadata with buddies
 - Addition of links to documents with related semantic information
 - Interfaces used for interaction

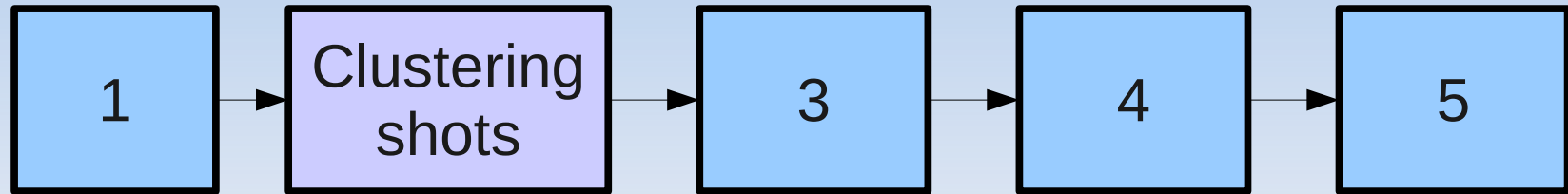
Methodology

- Initial architecture



Past and present work

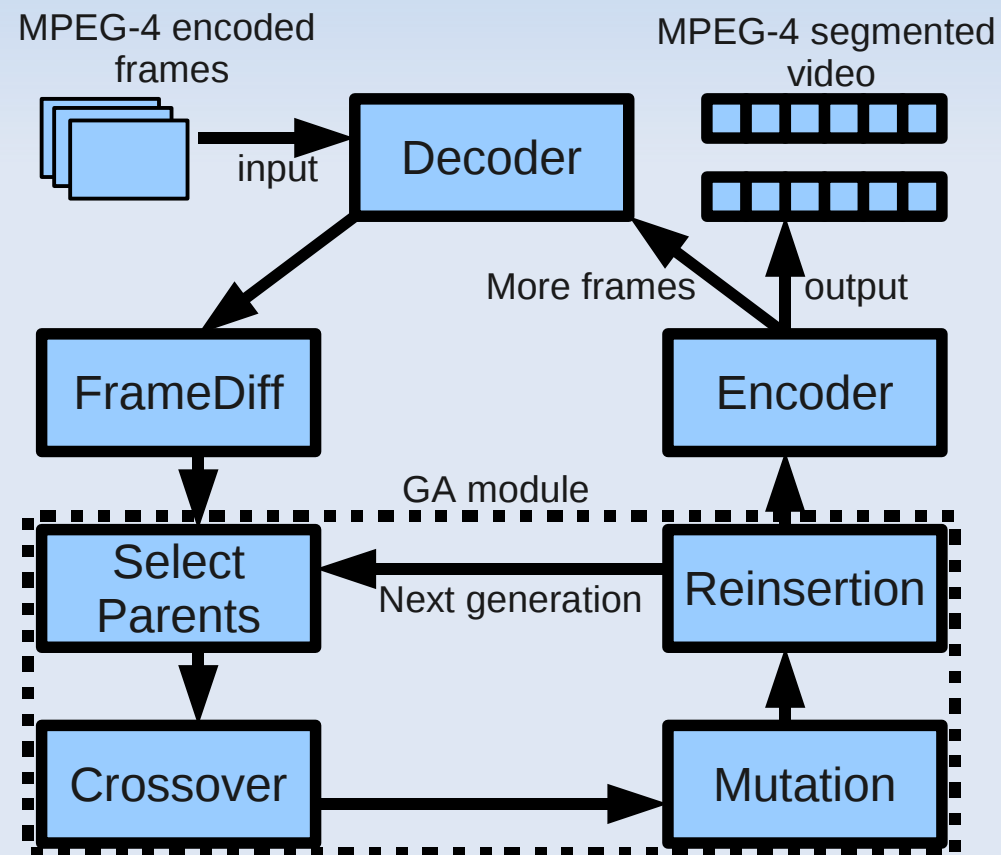
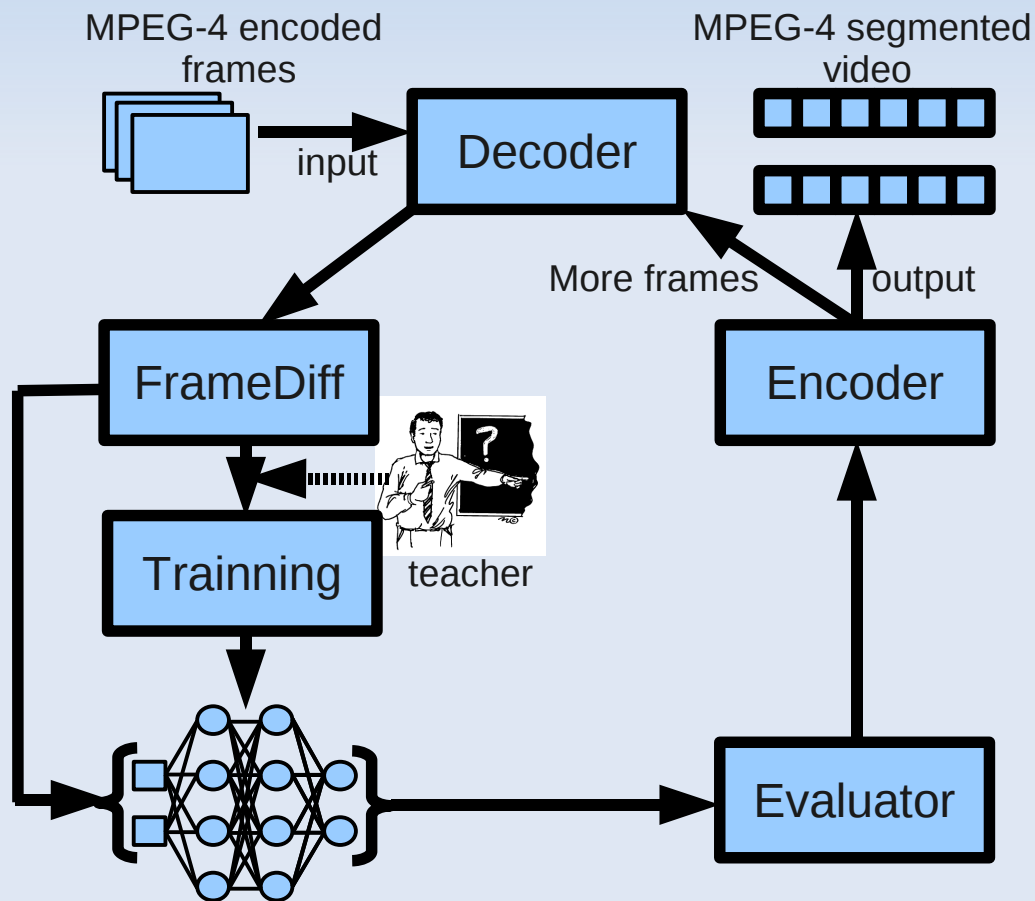
- Timeline:



- 1. Shot boundary detection based on intelligent systems
- 3. Classification of video news programs using genetic algorithms
- 4. User's profile generation containing preferences about specific categories of news using peer-level annotations
- 5. Recommender system of scenes from movies based on peer-level annotations

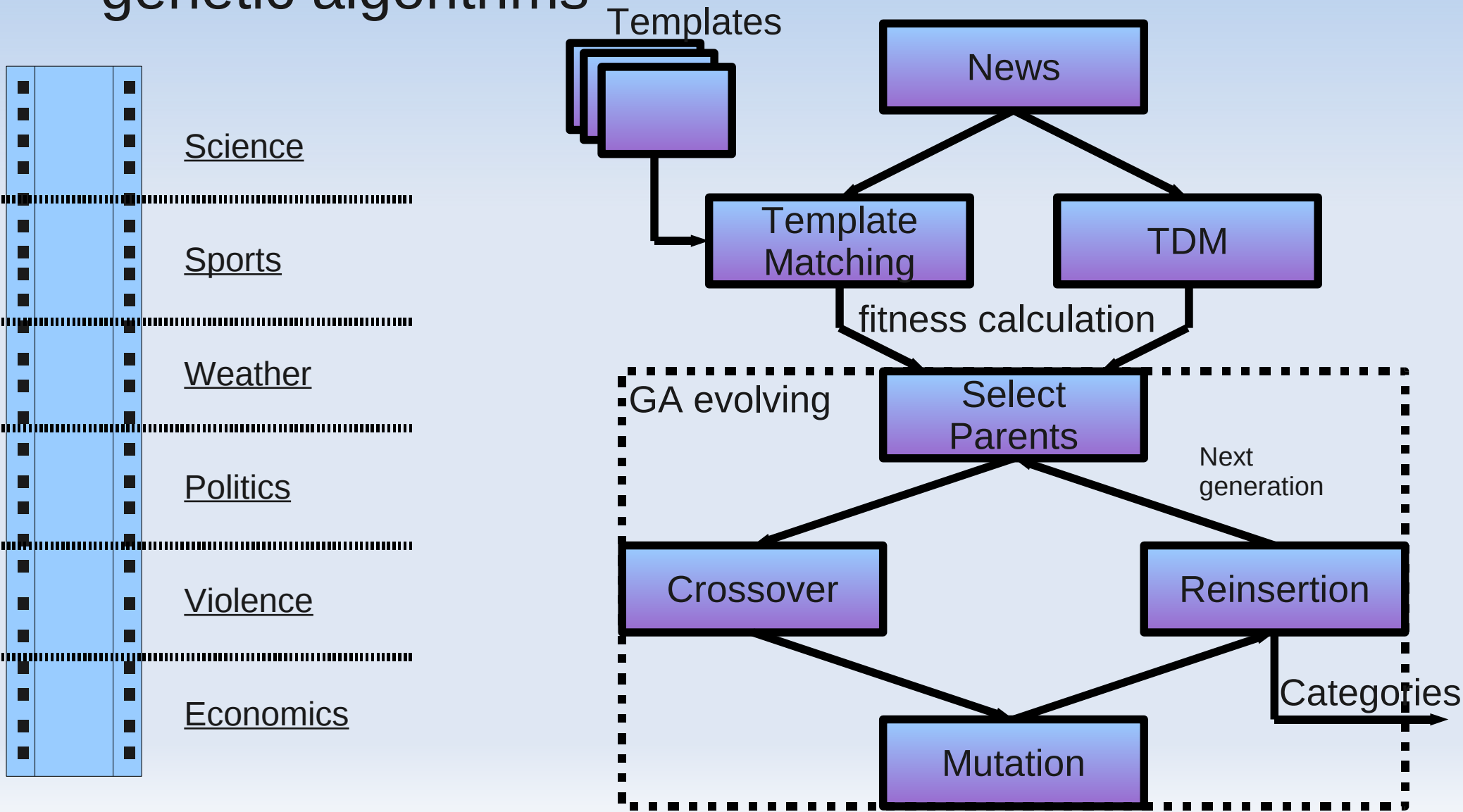
Past and present work

- Shot boundary detection based on intelligent systems



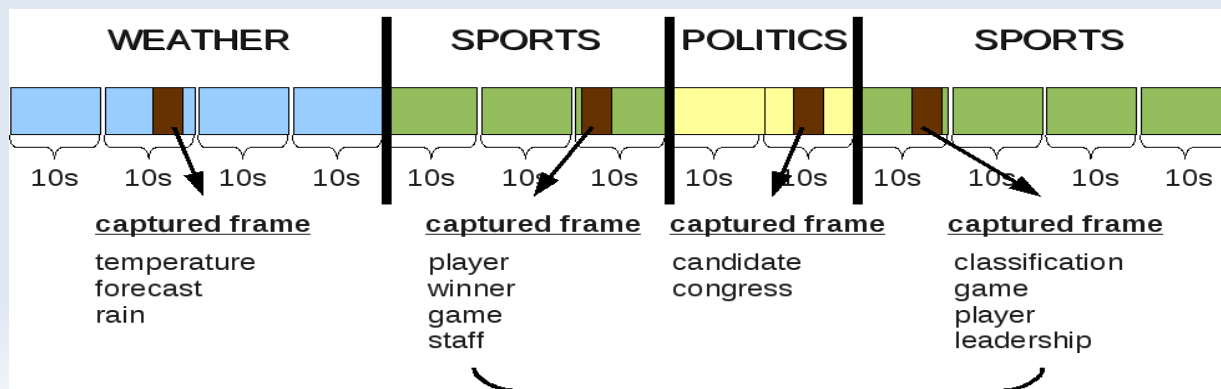
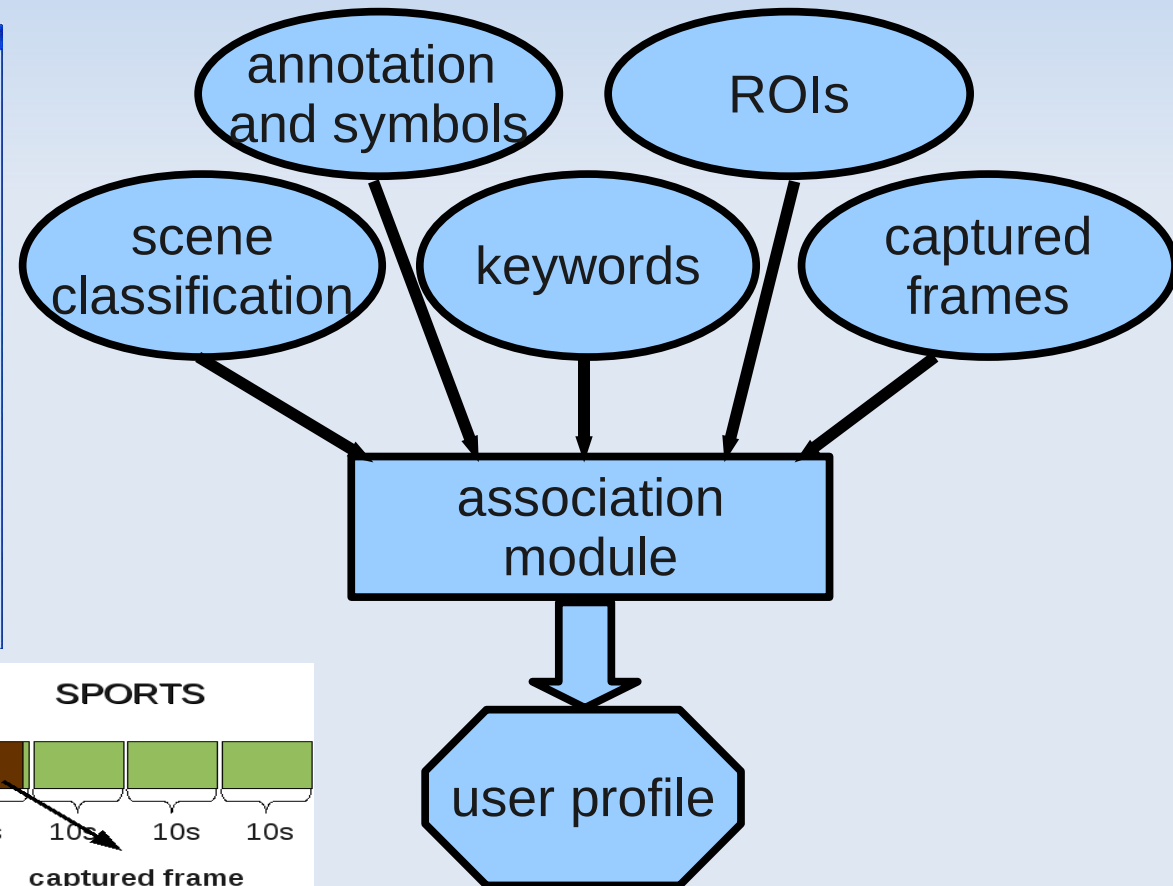
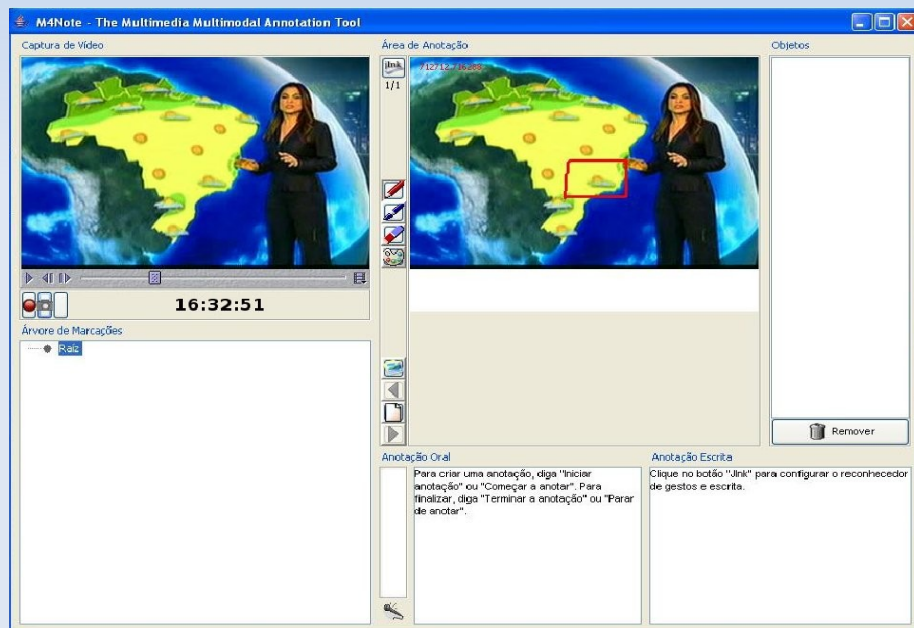
Past and present work

- Classification of video news programs using genetic algorithms



Past and present work

- User's profile generation containing preferences about specific categories of news using peer-level annotations



Past and present work

- Recommender system of scenes from movies based on peer-level annotations

The screenshot shows the 'The Multimedia Multimodal Annotation Tool' interface. It features a video player on the left with a timestamp of 02:27:750. The main area is divided into 'Área de Anotação' (Annotation Area) and 'Objetos' (Objects). The video frame shows a scene with two people, one of whom is highlighted with a blue box and a red dashed circle. A red dashed circle also encompasses the 'Anotação Escrita' (Written Annotation) field, which contains the text: 'Pam and Craig are visiting her ex-boyfriend's new house. Pam's father seems to like more her ex-boyfriend than he likes Craig.' Below the video player, there are two subtitle extraction options: 'Anotação Oral' (Oral Annotation) and 'Anotação Escrita' (Written Annotation). The 'Anotação Escrita' option is selected, and a subtitle is shown below it: 'Clique no botão "Link" para configurar o reconhecedor de gestos e escrita.' To the right of the main interface, there are two smaller video frames labeled (c) Handwriting recognition and (d) Regions of interest. Below these, there are two yellow bars representing subtitle extraction, labeled (e) Subtitle. At the bottom right, there is a larger video frame showing two people sitting on a couch, with arrows pointing to two smaller video frames below it.

(a) The Multimedia Multimodal Annotation Tool interface showing video, annotations, and subtitle extraction.

(b) Speech recognition

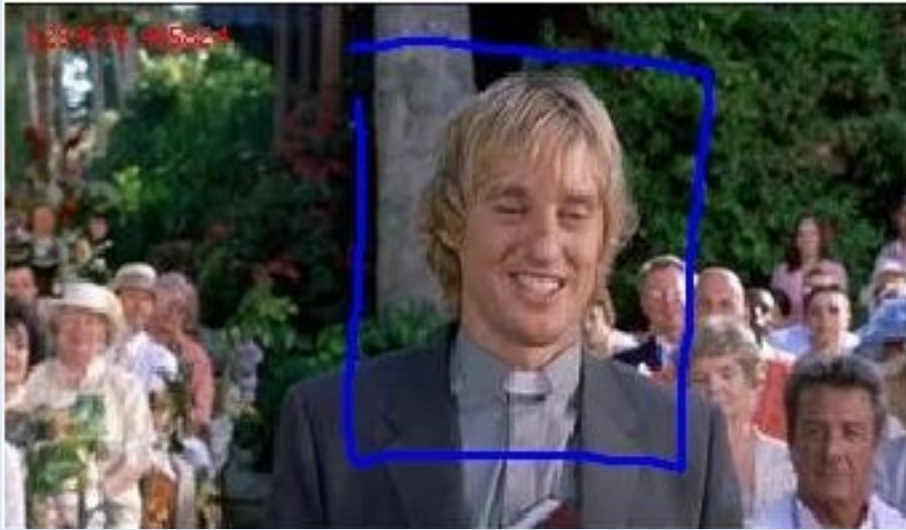
(c) Handwriting recognition

(d) Regions of interest

(e) Subtitle

Past and present work

- Recommender system of scenes from movies based on peer-level annotations



User says: "Kevin will pray in the wedding because he became a rabbi after having known Greg, who is jewish"

AmbulantPlayer

File Play View Help

Recommender System

Recommendations:

	Cena 15 Casa do ex da Pam [
	Cena 8 Jantar
	Cena 17 Enchente no quintal e incendio
	Cena 19 Procura do gato

Future work

- Other metadata extraction techniques
 - Sound information analysis – user's excitement and mood
 - Object recognition – cars, locations, etc.
- Combination of techniques using services compositions
 - Services description using WSDL?
- Collaborative annotations from various users into an unique content
 - Combination of different metadata
 - Incentive mechanisms
- Apply to specific domains (IPTV, digital television, desktop applications, etc.)

Achievements

- Manzato, M. G.; Goularte, R. Shot Boundary Detection Based on Intelligent Systems. In: *Proceedings of the XIII Brazilian Symposium on Multimedia and the Web (WEBMEDIA)*, 2007, October, 21st. to 24th., Gramado-RS. N. York: ACM Press. p. 190-197.
- Manzato, M. G.; Goularte, R. Video News Classification for Automatic Content Personalization: A Genetic Algorithm Based Approach. In: *Proceedings of the XIV Brazilian Symposium on Multimedia and the Web (WEBMEDIA)*, 2008, October, 26th. to 29th., Vila Velha-ES. N. York: ACM Press. p. 1-10.
- Manzato, M. G.; Macedo, A. A.; Goularte, R. Evaluation of Video News Classification Techniques for Automatic Content Personalization. *International Journal on Advanced Media and Communications (IJAMC)*, 2009. (to appear)
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- Manzato, M. G.; Coimbra, D.; Goularte, R. Multimedia content personalization based on peer-level annotation. In: *Proceedings of the 7th. European Interactive TV Conference (EuroITV)*, 2009, July, 3rd. to 5th., Leuven, Belgica. N. York: ACM Press. p. 57-66.

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