KAIFIA: Knowledge Assisted Intelligent Framework for Information Access

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OVERVIEW

Problem Statement

Ideas
- Future Application of Topic Maps
- Related projects
- KAIFIA - Knowledge Assisted Intelligent Framework for Information Access

Achievement
- DREAM- Dynamic RetriEval, Analysis and semantic metadata Management

Future Works
PROBLEM STATEMENT

- **Topic Map Advantage**
  - Information Access, Information Exchange and Information Integration
  - Topic Map is currently being used in many applications like E-Government, E-Learning, E-Commerce, etc

- **Problems**
  - Manual Annotation with Topic Maps
  - Visualisation of big topic maps
  - + Many other problems

FUTURE APPLICATIONS OF TOPIC MAPS

- **Topic Map is yet to establish a framework to meet new challenges:**
  - Automatic Topic Map Population
  - Reasoning in Topic Maps for Intelligent Interactive Applications
  - Visualising Complex and Large “Infospheres”
  - Intelligent searches

**Research Area**

- Natural Language Processing (NLP)
- Reasoning
- Topic Map Exploration

**KAIFIA** is a conceptual framework that aims at addressing these challenges.
RELATED WORK

- **Intelligent Topic Manager (ITM) - Mondeca**
  - Legal Publishing Domain where author of legal articles is informed of court decisions and legal text.
  - Integration between Information Extraction Tool and Ontological concepts to map words, concepts and their occurrences.

- **HOLMES**
  - Investigation Management System – assist in management of complex process of investigating serious crimes
  - Information Notification and Graphical Representation of events.

- **ONI, Office of Naval Intelligence - Ontopia**
  - Topic Map Based Solution to filter multiple threads of data to identify alarming trends and create a unified and organised analysis.

KAIFIA FRAMEWORK

[Diagram of KAIFIA framework showing layers and components]
KAIFIA – INTELLIGENT REASONING LAYER

- **Missing Link Resolver and Reasoning Agent**
  - Identify potential links between topics
  - E.g. “Buying” action contains an equal action of “Selling”, same event but interpreted from different viewpoints
  - Background queries called “Monitoring”

- **Analytic Tactics**
  - Domain-specific scenarios to conceptualise case-based patterns

- **Viewpoint Mapper**
  - Personalised user viewpoints, according to user role, nature of information, etc

KAIFIA – KNOWLEDGE LAYER (1)

**Topic Maps as an enabling technology for Knowledge Representation**

- **Topics and Associations**
- **Mid Level Ontologies**
- **Upper Ontologies**
DREAM: Dynamic RetriEval, Analysis and semantic metadata Management

- **Objectives:**
  - Semi-automatic acquisition of knowledge from multimedia content
  - Build network of scalable ontologies
  - Ontology evolution through multimedia concepts extraction
  - Personalised knowledge representation for users’ perspective
  - Natural Language Based Query Language

- **Project Partners**
  - Double Negative
  - The Foundry
  - FilmLight

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**DREAM SEMANTIC TOPIC MAP**
NLP Templates
- Subject Identification
- Action Identification
- Object Identification

Example
- “No 10 denied that Gordon Brown exploit Lady Thatcher for political benefits” – BBC Text
- Topics Identified: “No10”, “Gordon Brown”, “Lady Thatcher”, “Political benefits”
- Actions Identified: “Deny”, “Exploit”
- The action “Deny” is associated to a cloud of topics
  - [No 10 denied] [Gordon Brown exploit Lady Thatcher for political benefits]
AUTOMATIC TOPICS EXTRACTION (2)

- One Semantic Container represents statement which contains
  - List of entities
  - List of action
  - List of semantic containers

FUTURE WORKS

- REASONING by employing predicate logic rules from MILO and SUMO
- REPRESENTATION of a whole context in Topic Maps
- VISUALISATION of complex topic maps using Hot Spots/Frozen Forests
Thank You for your attention

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