KBM – Text and Image

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http://abcdefridays.blogspot.nl/2012/09/text-as-image.html

Outline

- Summary last lecture
- Text – a visual sign system
- Image – a different visual sign system

Intro knowledge - summary

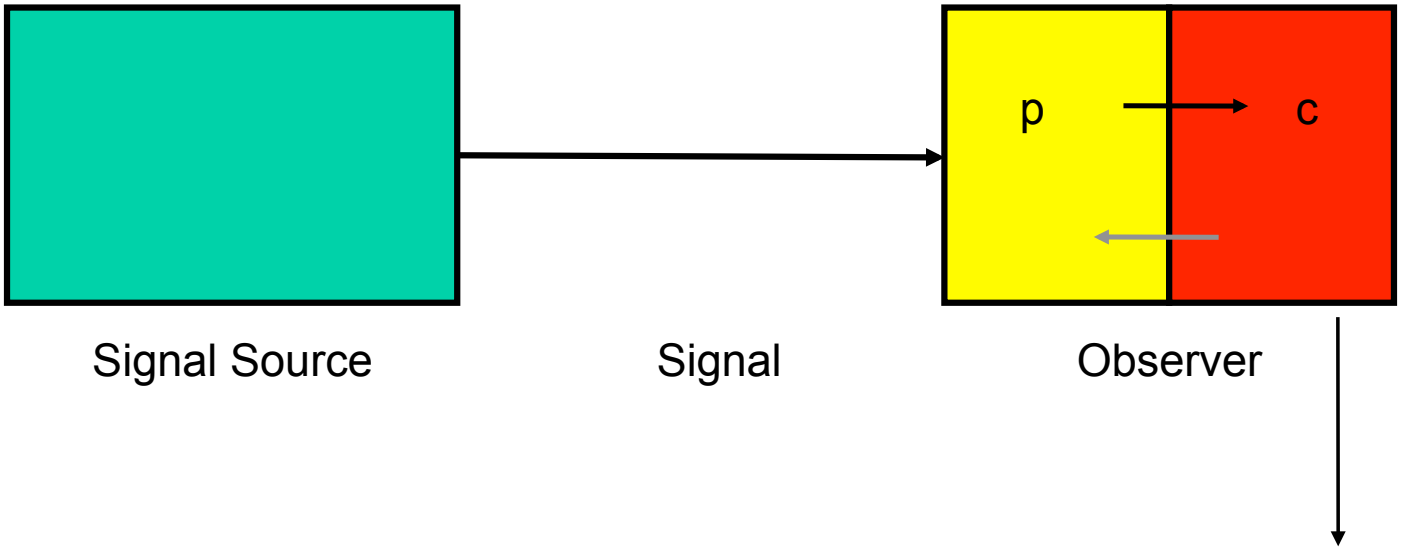
Investigated

- The concept of context

Findings

- The access of information depends on the personal, spatial and temporal context in which a user is situated.
- Context requires the synchronisation of several models (e.g. user, presentation, knowledge, location, etc).
- Modelling context requires a clear understanding of the tasks performed by the user, as it is them that determine the detail required in the content description of the media items => one approach towards restricting descriptions (reduce complexity).
- Keeping track of events in time is essential to allow a system to adapt to the user through learning (history model).

Knowledge and symbolic communication

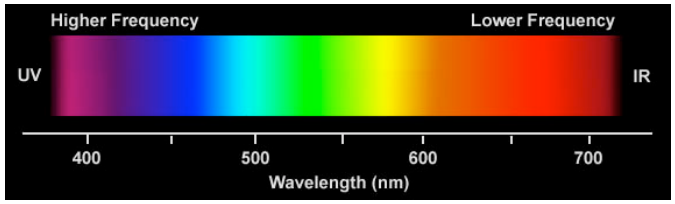


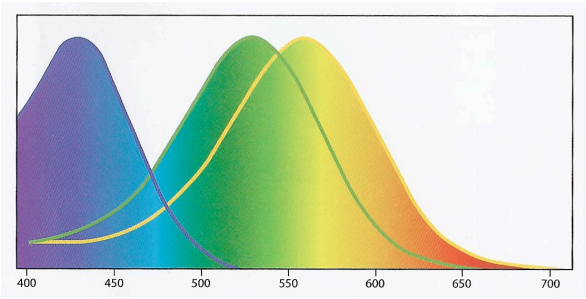
Knowledge :

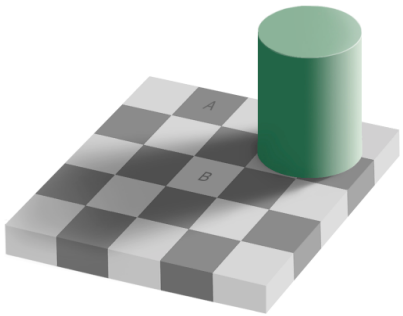
expertise, and skills acquired through experience or education

p = perceive
c = conceive

Knowledge example - Colour



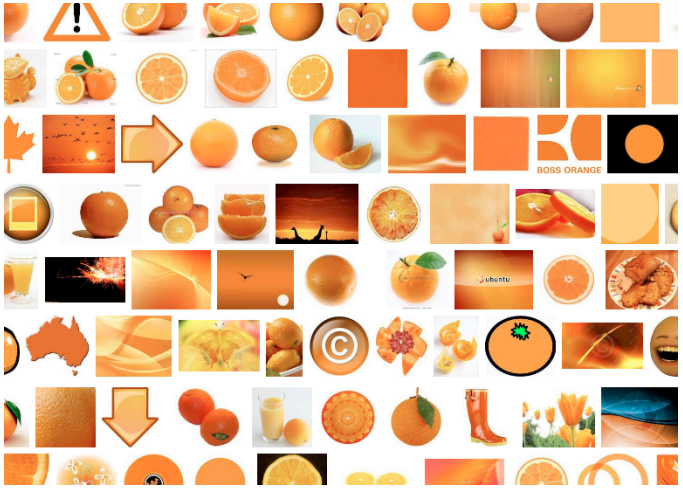




Colour

- Physical phenomenon
- Psychological phenomenon
- Social phenomenon

Knowledge example - Colour



Orange example provided by courtesy of Steven Pemberton

Sapir-Whorf Hypothesis: Connection between thought and language.

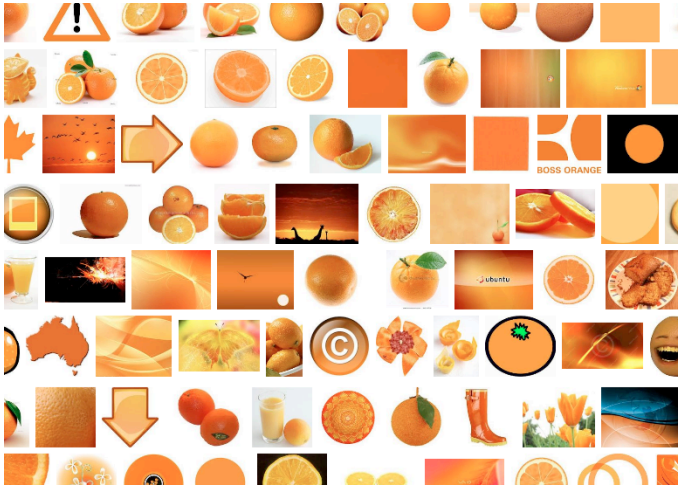
If you haven't got a word for it, you won't think about it (linguistic relativity).

If you don't perceive it as a concept, you won't invent a word for it.

In English there are 11 basic colour names (that is, roughly speaking, words that we teach our children):

Red, orange, yellow, green, blue, purple, brown, pink, black, white, grey

Knowledge example - Colour



Orange example provided by courtesy of Steven Pemberton

So do you think that the colour orange is named after the fruit, or the fruit is so-called because of its colour (England)?

In fact there was no colour orange in English until the introduction of the fruit in the 16th century. Until then it was just a reddish-yellow.

The progression of the name was unsurprisingly gradual. After the introduction of the fruit, you find people talking of things having an "orange hue" (where "orange" still refers to the fruit), and it wasn't until around 1600 that people started using the word orange as a free-standing colour name.

Knowledge example - Colour

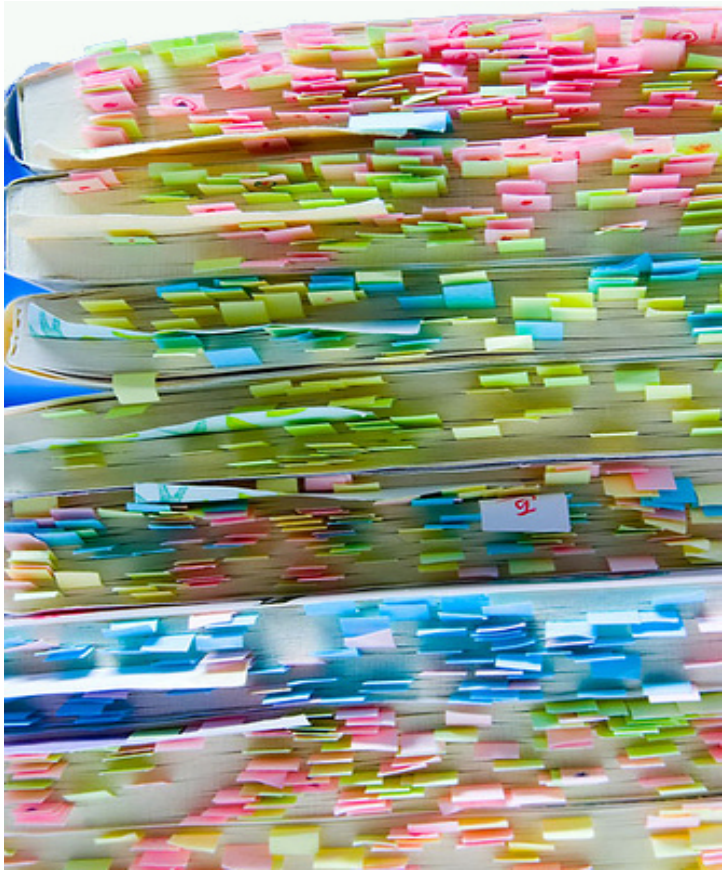
http://www.boreme.com/posting.php?id=30670

It turns out that how the colour spectrum gets divided into names is **largely cultural**

For instance **Ao** (青) is a Japanese color that covers English blue and green: in Japan, green traffic lights are *ao shingo*, blue skies are *ao zora*, and green apples are *ao ringo*.

The African Himba language and the Mexican Tzeltal language are examples of other languages that do the same.

Knowledge and symbolic communication



Representing knowledge in media-based systems requires:

- Relevant conceptual models
- A language to represent the models
- Interpretation mechanisms

Text – a visual sign system

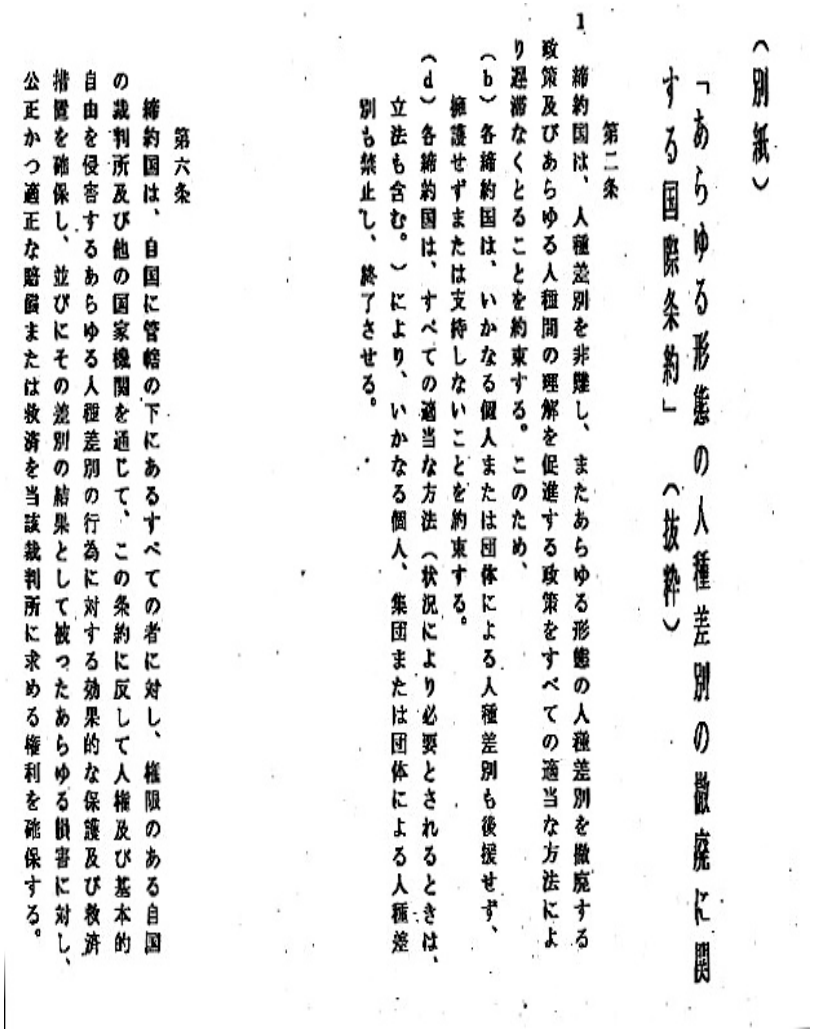
Approaching text

A (Alphabet)

Saussure, Ferdinand de - (1857-1913) Swiss linguist. His *Course in General Linguistics* (1916, posthumous) is generally considered to be the foundation of modern linguistics. He envisaged the development of semiology as a science of signs.

Peirce, Charles S. - (1839-1914) American scientist and philosopher. One of the foremost philosophers of 'pragmatism' - no object or concept possesses validity or importance in its own right. Its significance lies only in the practical effects of its use or application. For Communication and Media students, his importance lies primarily in his development of semiotics.

B (Logogram)



（別紙）

「あらゆる形態の人種差別の撤廃に関する国際条約」（抜粋）

第二条

1 締約国は、人種差別を非難し、またあらゆる形態の人種差別を撤廃する政策及びあらゆる人種間の理解を促進する政策をすべての適当な方法により遅滞なくとることを約束する。このため、

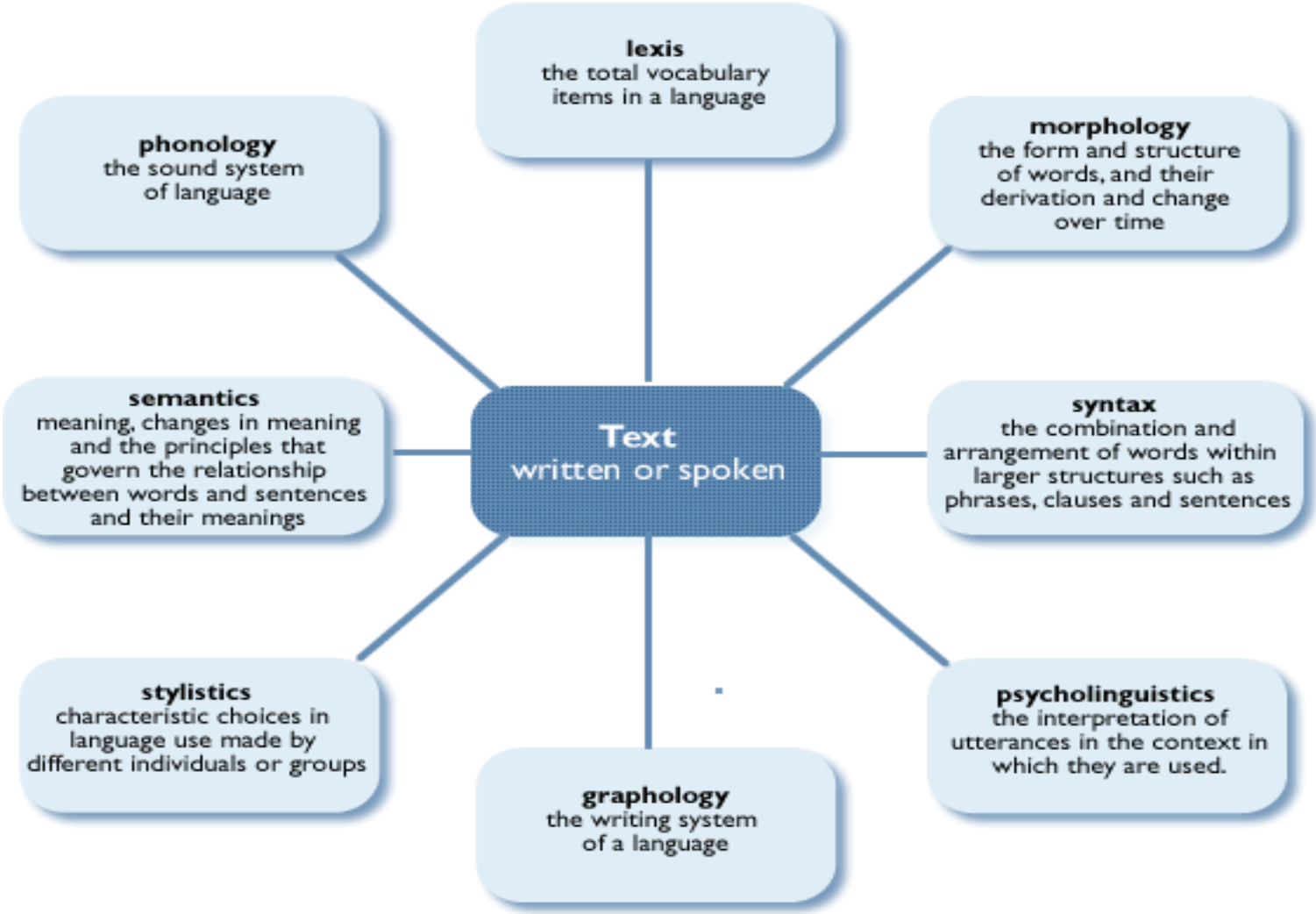
（b）各締約国は、いかなる個人または団体による人種差別も後援せず、擁護せずまたは支持しないことを約束する。

（d）各締約国は、すべての適当な方法（状況により必要とされるときは、立法も含む。）により、いかなる個人、集団または団体による人種差別も禁止し、終了させる。

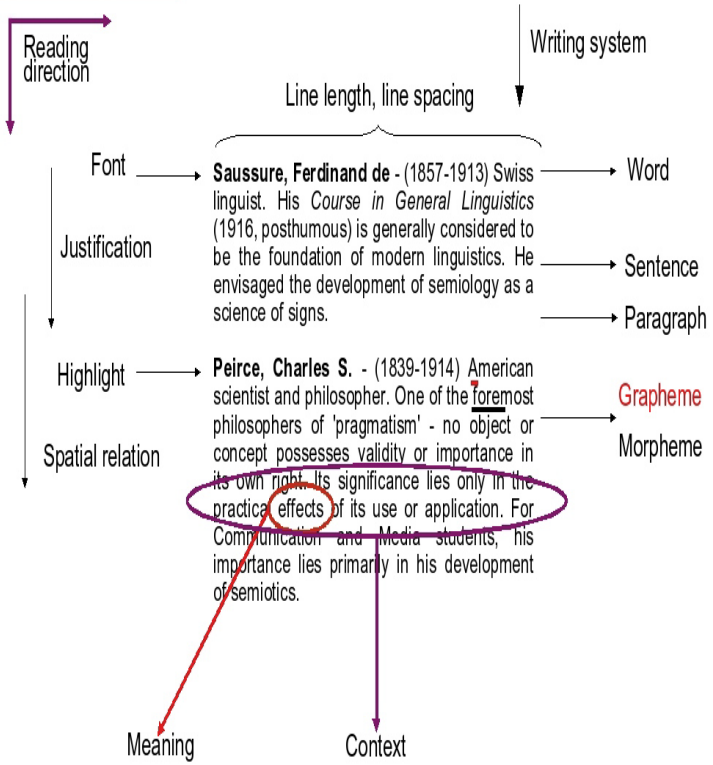
第六条

締約国は、自国に管轄の下にあるすべての者に対し、権限のある自国の裁判所及び他の国家機関を通じて、この条約に反して人権及び基本的自由を侵害するあらゆる人種差別の行為に対する効果的な保護及び救済措置を確保し、並びにその差別の結果として被ったあらゆる損害に対し、公正かつ適正な賠償または救済を当該裁判所に求める権利を確保する。

Approaching text



Text – a sign system I



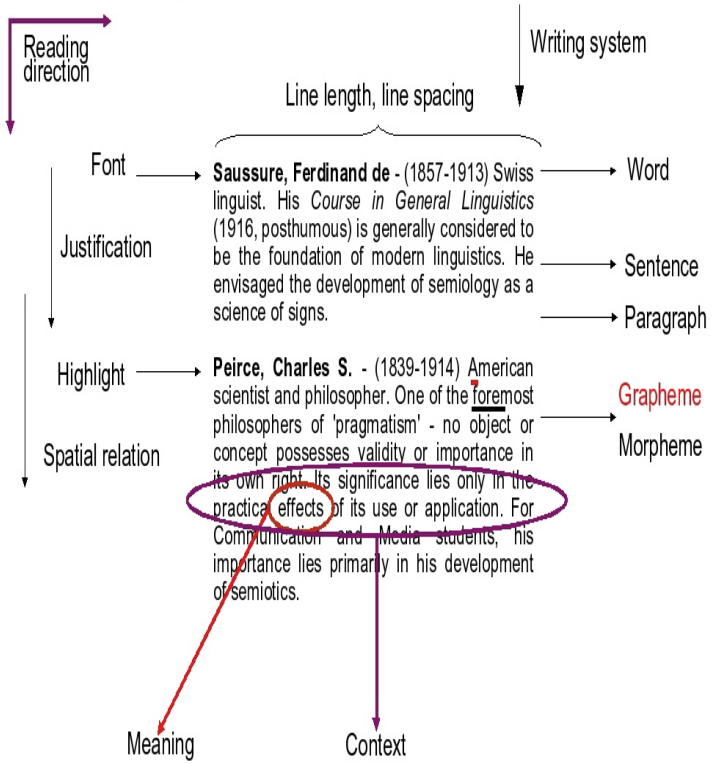
A code is a rule-governed system of signs, whose rules and conventions are shared amongst members of a culture, and which is used to generate and circulate meanings in and for that culture.

A set of **signs** that carry meaning.

A set of agreed **rules** for combining those signs together

- Perceptual (e.g. Typography)
- Syntagmatic (e.g. Grammar)
- Paradigmatic (e.g. Ontology)
- Social (e.g. Word use)

Text – a sign system II



Syntagms are often defined as 'sequential' (and thus *temporal* - as in speech and music), but they can represent *spatial relationships*. The plane of the syntagm is that of the *combination* of 'this-*and*-this-*and*-this' (syntax).

Example:

shoes socks pants sweater scarf hat

A **paradigmatic** structure represents potential substitutions in which a range of candidates can take the place of a sign in the syntagmatic structure. The plane of the paradigm is that of the *selection* of 'this-*or*-this-*or*-this' (semantics).

Example:

knickers
short
shoes socks pants sweater scarf hat
kilt
tights

Text – a sign system III

Representation and Transformation mechanisms

Syntagm

- **Spatial relations (horizontal and vertical axi, centre and margin)**
- **Logical order (grammar)**
- **Exposition (proposition, evidence, justification**
- **Narrative space (exposition, retardation, digression, omission, redundancy)**
- **Narrative time (ellipses, compression, insertion, dilation)**

processes

Paradigm

- ***clusters*** **(e.g.** ***synonyms)***
- ***doublets*** **(e.g.** ***oppositions)***
- ***proportional series*** **(e.g. a series of oppositional doublets such as** ***female - male, passive - active,*** **etc.)**

=> Taxonomy

- ***hierarchies*** **(ordered semantic units based on relations of inclusion or exclusion, e.g.** ***Pekinese/dog/animal/living thing).***

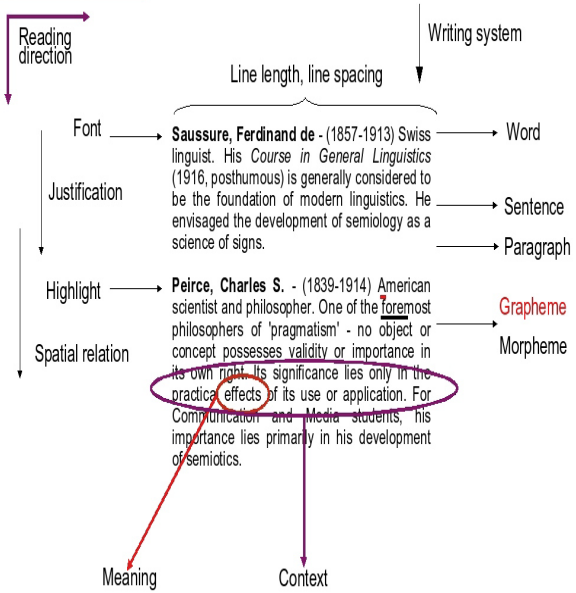
=> ***Thesaurus***

Semantic field: '...a conceptual structure which organises potential meanings in relation to others'
=> Conceptual graph, semantic network, ontology

Text – Description languages/mechanisms

- XHTML(5) is a markup language that has the same depth of expression as HTML, but also conforms to XML syntax.
- XHTML Basic is an XML-based structured markup language primarily used for simple (mainly hand-held) user agents, typically mobile devices.
- DATR is a language for lexical knowledge representation. The lexical knowledge is encoded in a network of nodes. Each node has a set of attributes encoded with it.
- CyCL is a declarative language based on classical first-order logic, with extensions for modal operators and higher order quantification
- RDF a general method of modelling information, through a variety of syntax formats
- RDFa adds a set of attribute-level extensions to HTML, XHTML and various XML-based document types for embedding rich metadata within Web documents.
- RDFS is an extensible knowledge representation language, providing basic elements for the description of ontologies
- OWL is a family of knowledge representation languages for authoring ontologies that are based on Description Logics.
- Dublin Core is a standard for cross-domain information resource description. It provides a simple and standardised set of conventions for describing things online in ways that make them easier to find.
- FOAF is a machine-readable ontology describing persons, their activities and their relations to other people and objects

Text – a sign system summary I

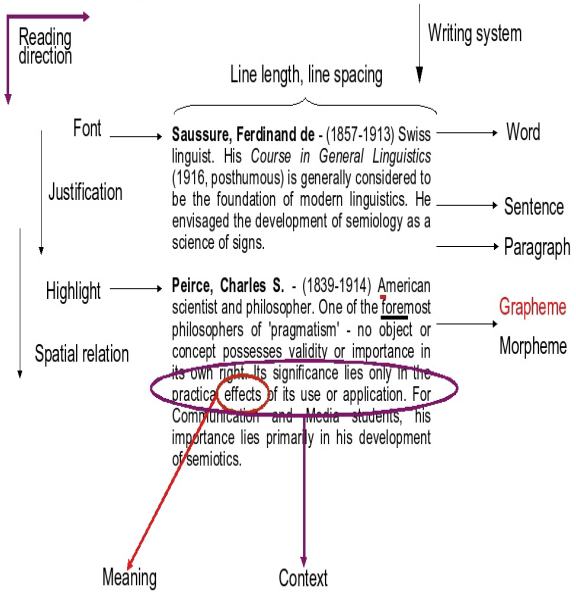


Text is a sign system strong on **arbitrariness**, proposing the autonomy of language in relation to reality.

Text emphasis on internal structures and thus does not 'reflect' reality but rather *constructs* it.

Text is **conventional** with an emphasis on the types **index** and **symbol**.

Text – a sign system summary II



Representing Text in a media-based system:

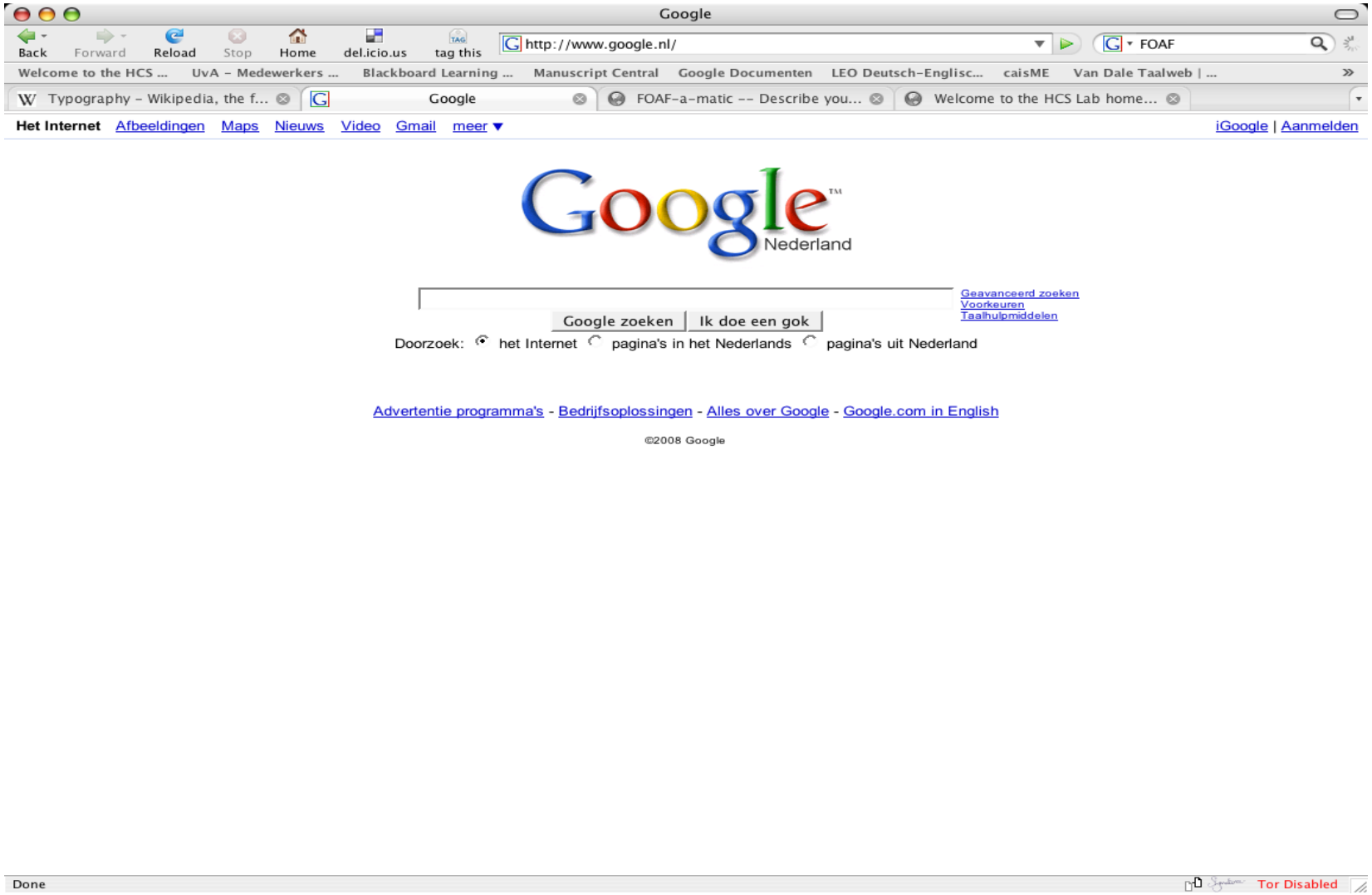
Conceptual models for:

- Typography
- Layout
- Writing system (e.g. Alphabet)
- Syntax (e.g. grammar, markup languages, ...)
- Dictionaries
- Semantics (e.g. taxonomy, thesaurus, ontology, conceptual graph, etc.)
- Style (e.g. frame, template, script,....)
- Genre (e.g. template, conceptual graph)

Interpretation depends on the task:

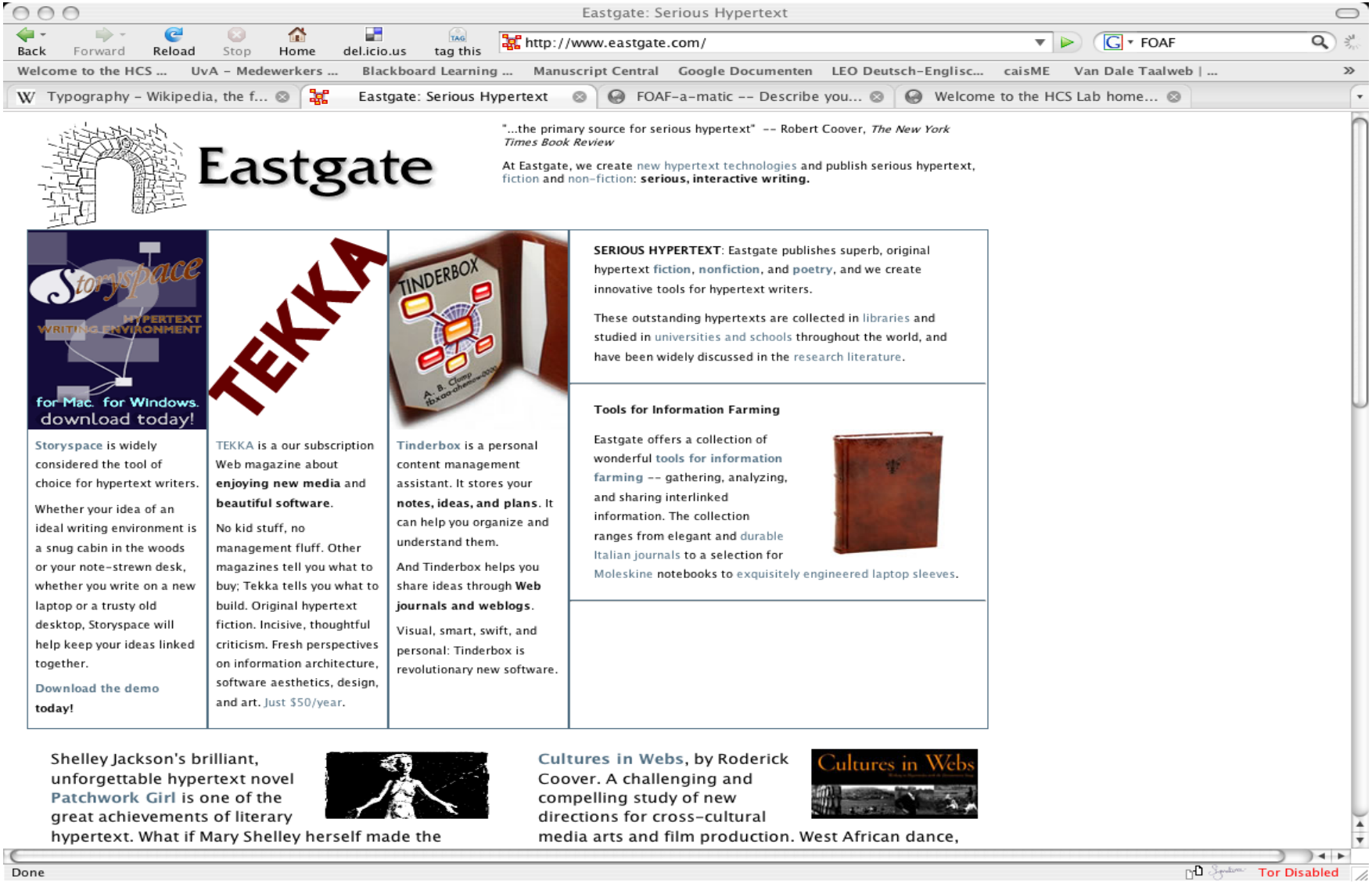
- Search (e.g. text understanding, word matching and/or ranking)
- Generation (e.g. text understanding, question-answering, ...)
- Comparison (e.g. Syntax (pattern matching) or semantics (clustering, distance evaluation, etc.)

Text – Applications I



Text – Applications II

Text – Applications III



Text – Applications IV

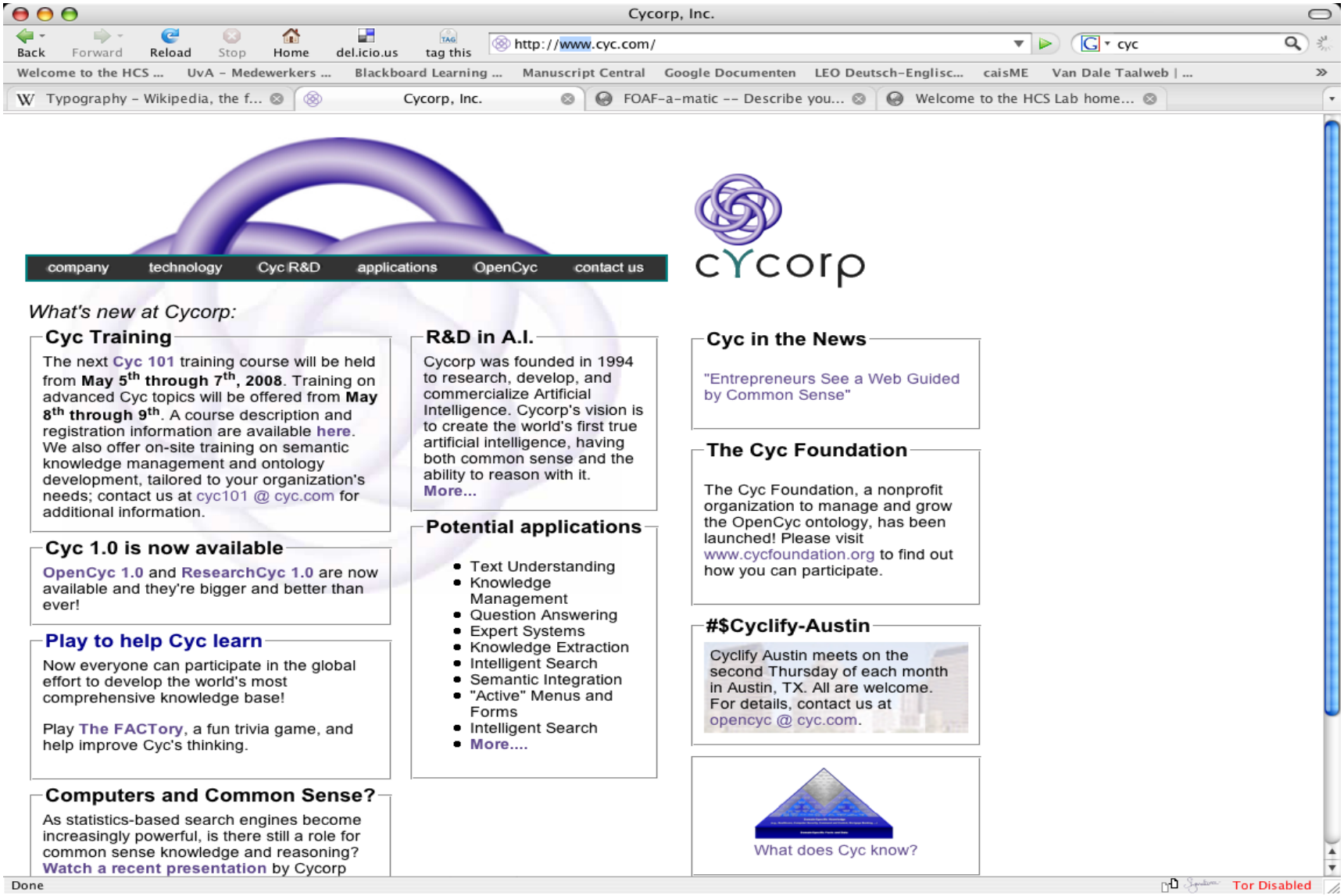
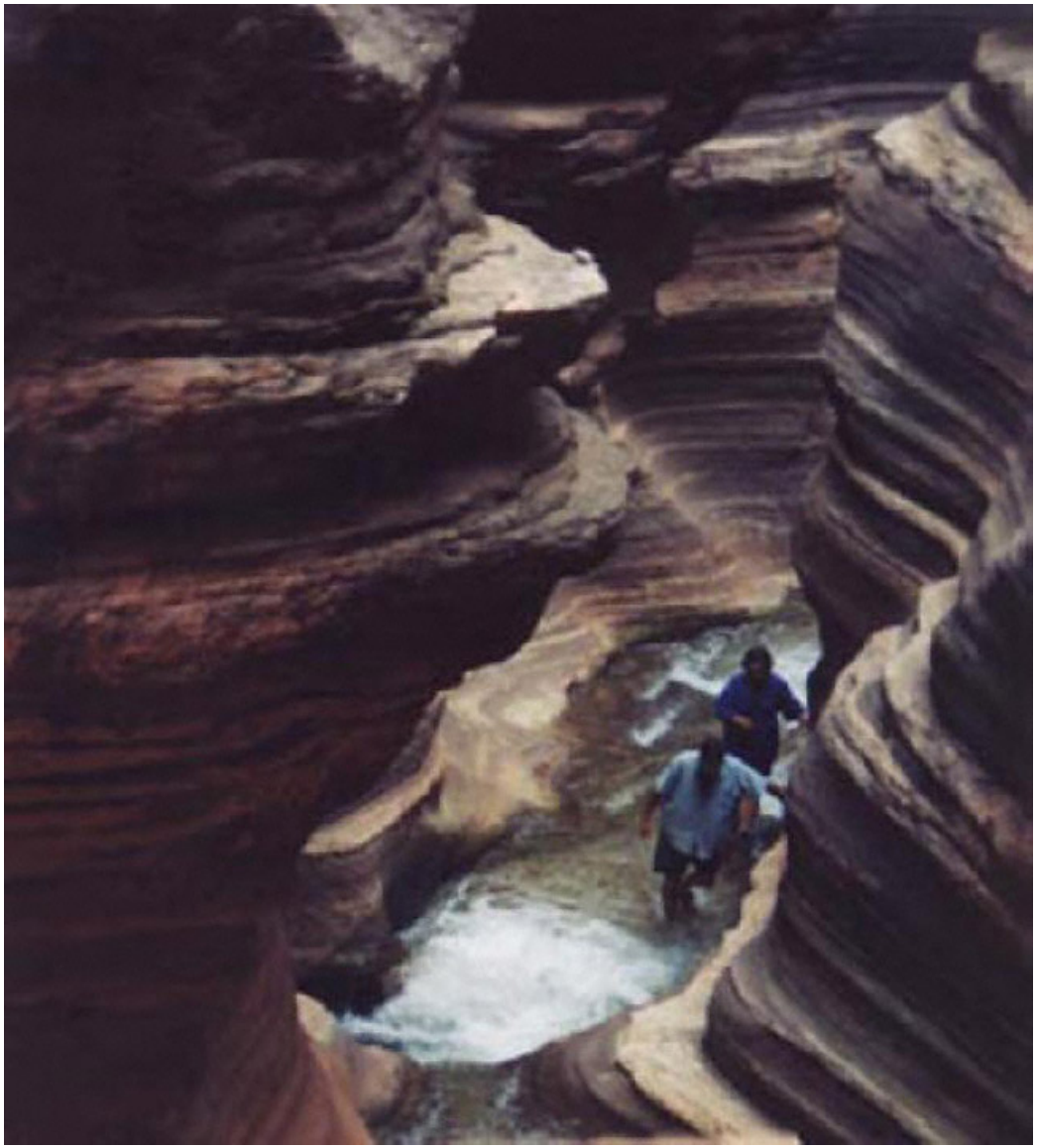


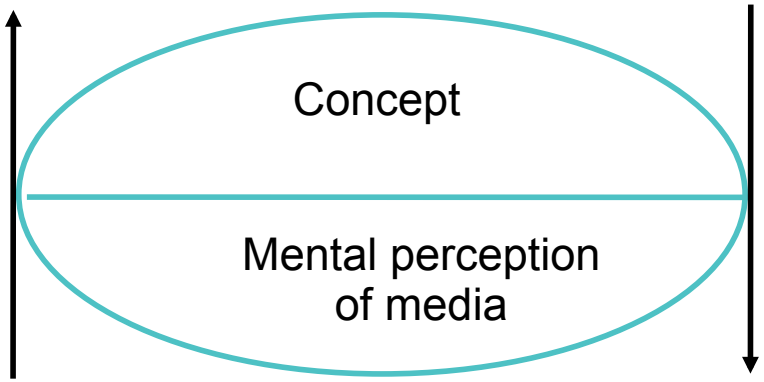
Image – a different visual sign system

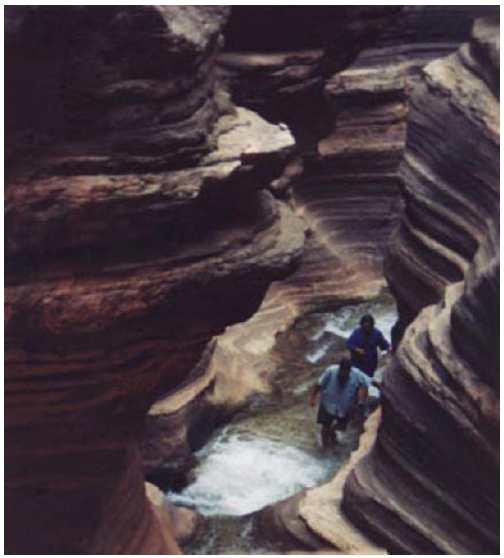


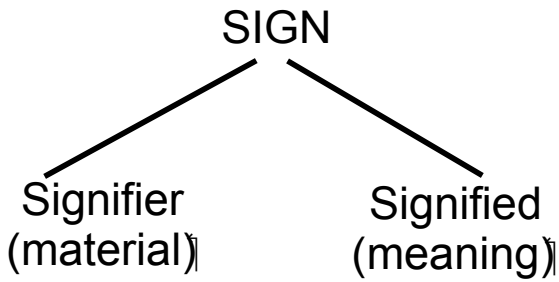
Approaching an image

" Legend of Orpheus & Eurydice ", 2001,
The Werner Collection
http://www.wernercollection.com/WorldView1.htm

Approaching an image







?

Approaching an image

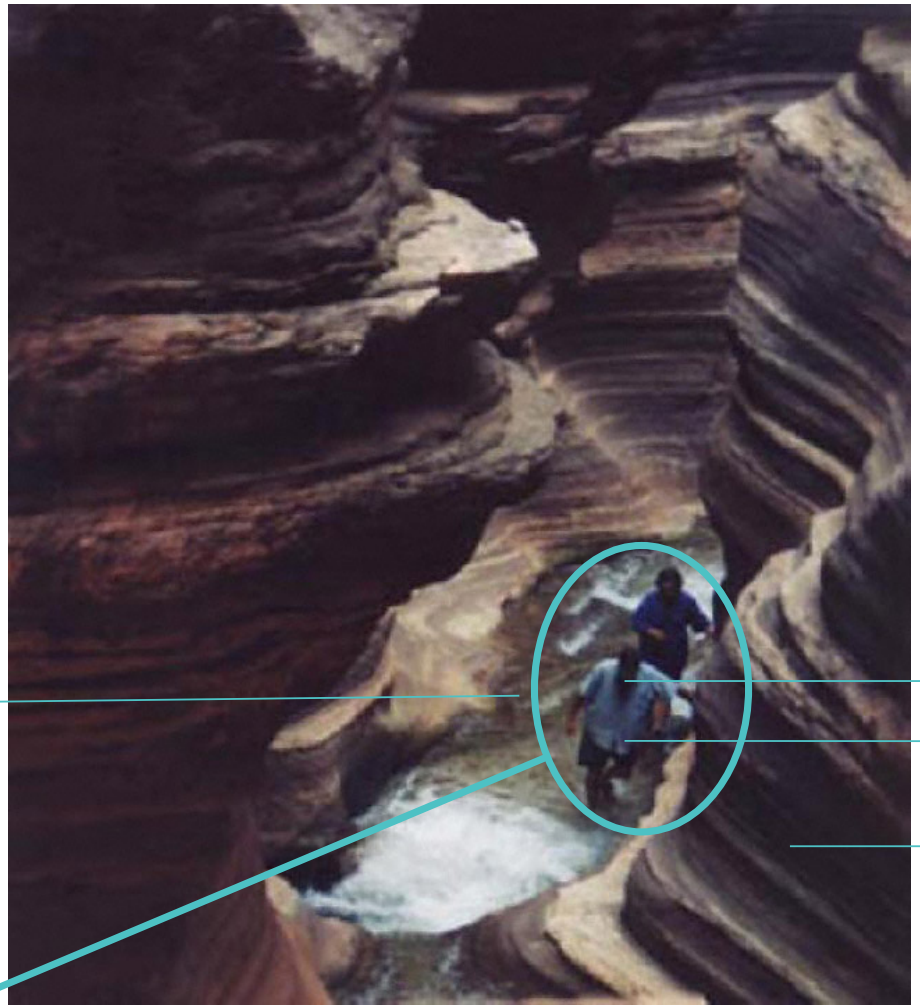
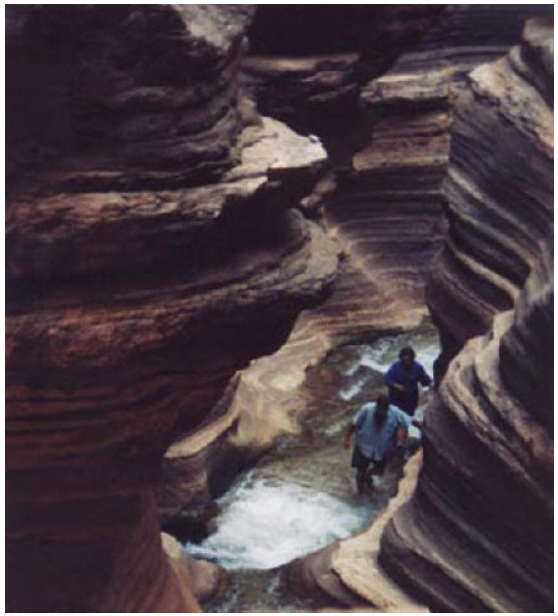


Image – a sign system I



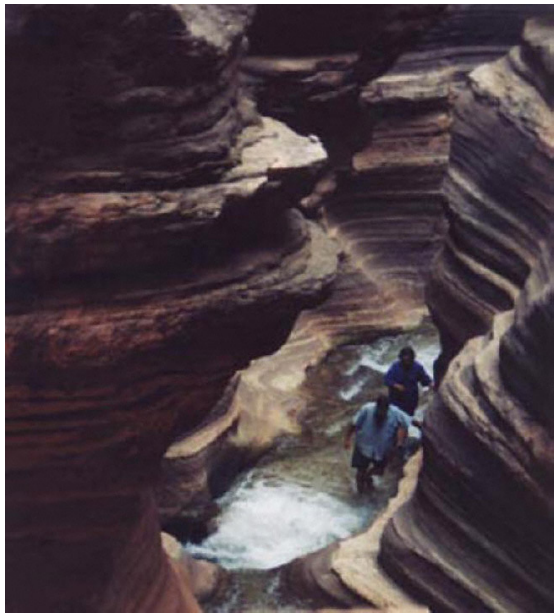
Perceptual codes

- *perceptive codes (establish the condition for effective perception)*
- *recognition codes which are blocks of signifieds we use to recognize objects*
- *transmission codes which construct the determining conditions for the perception of an image (dots that make up a newspaper image)*

Textual codes

- *tonal codes address the prosodic features by connoting them with particular intonation of the sign*
- *Iconic codes (figures, signs, semes)*
- Iconographic codes *connote more complex and culturalized semes that are immediately identifiable and classifiable, such as "the four horsemen of the Apocalypse".*

Image – a sign system II



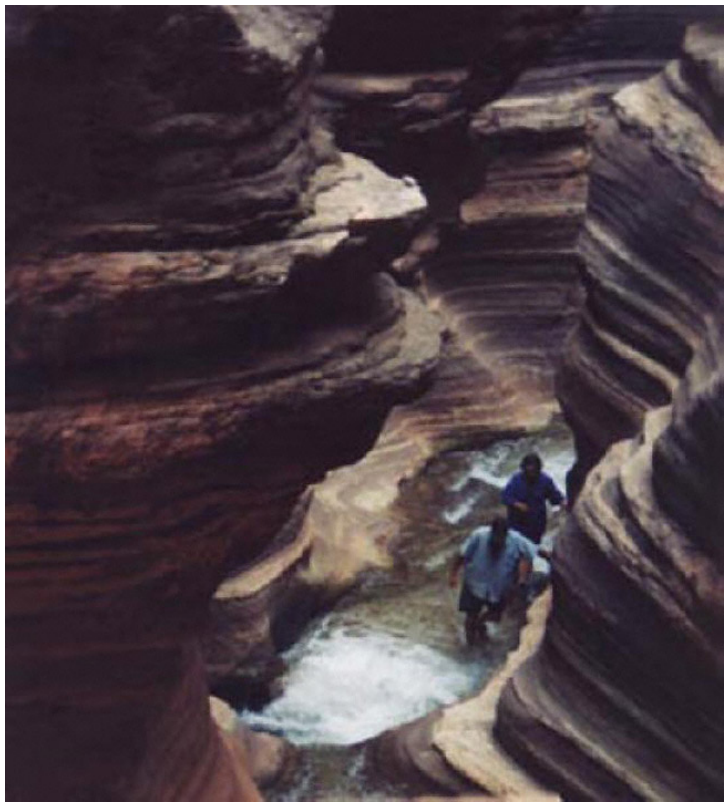
Social codes

- *verbal language*
- *bodily codes* (bodily contact, physical orientation, gaze, gestures and posture);
- *commodity codes* (fashions, clothing, cars);
- *behavioural codes* (protocols, rituals, role-playing, games)
- *ideological codes* (encoding' and 'decoding' information by using theories such as individualism, liberalism, feminism, materialism, capitalism, socialism, etc.)

Syntagmatic - paradigmatic codes

- *scientific codes*, including mathematics;
- *aesthetic codes* (poetry, drama, painting, sculpture, music, etc.)
- *genre, rhetorical and stylistic codes* (e.g. in narrative: plot, character, action, dialogue, setting, etc.),
- *mass media codes* (e.g. in photography, TV, film, radio, newspaper and magazine, etc

Image – a sign system III



Denotation describes the 'literal' or 'obvious' meaning of a sign. Thus, denotation of a representational visual image is what all viewers from any culture and at any time would recognize the image as depicting.

Denotation is the first level of **signification**.

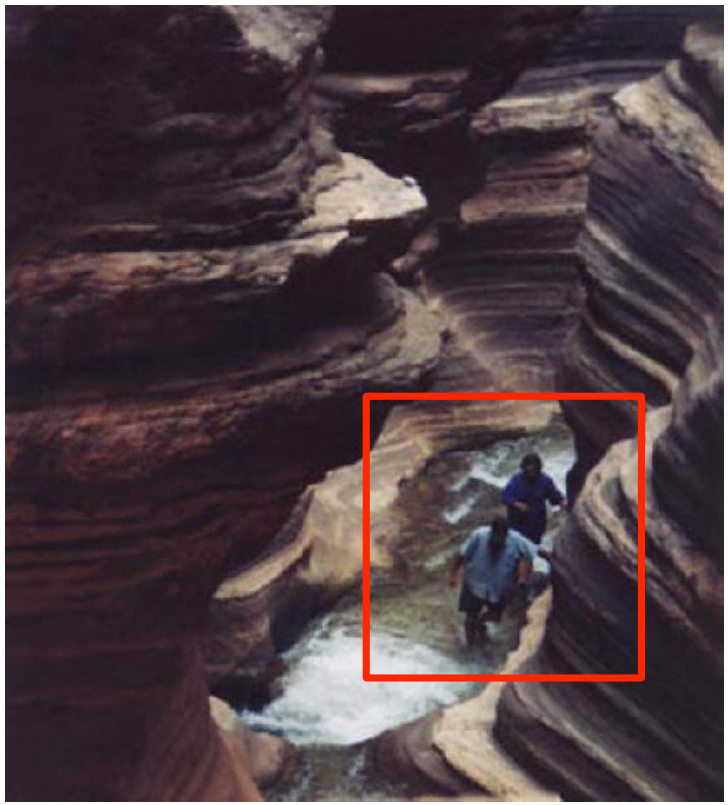
Sensory system ⟷ Media

Perceptual codes
Textual codes
Social codes

↓

Sign I
(denotative sign with signifier and signified)

Image – a sign system IV



Connotation refers to the socio-cultural and 'personal' associations (ideological, emotional etc.) of the sign. These are typically related to the interpreter's class, age, gender, ethnicity and so on.

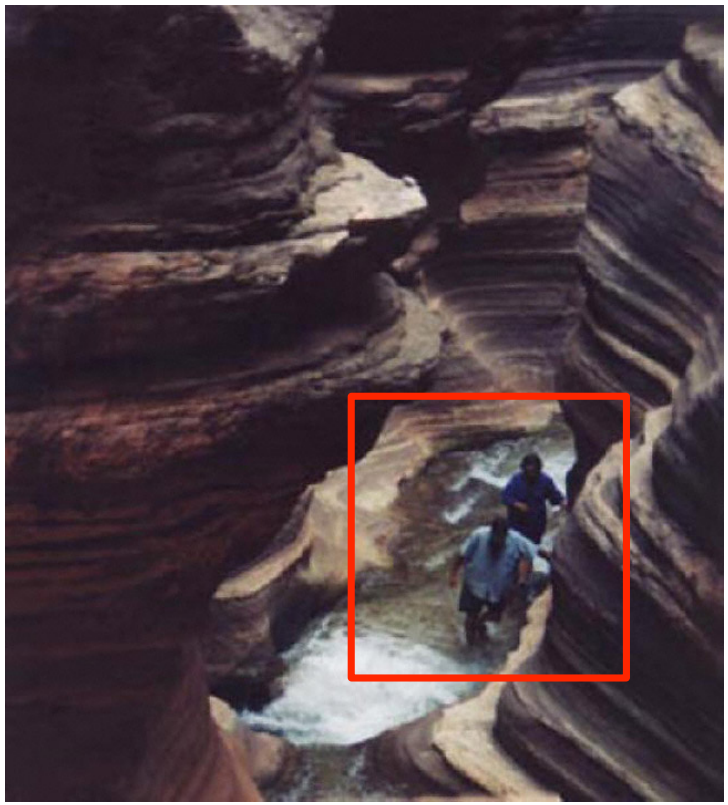
Connotation is the second level of **signification**.

Sign I + Signified

Social codes
Syntagmatic codes
Paradigmatic codes
+
experiences
associations

Sign II
(connotative sign with signifier and signified)

Image – a sign system V



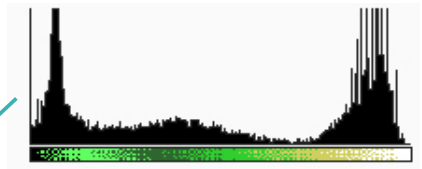
The third level of **signification**.

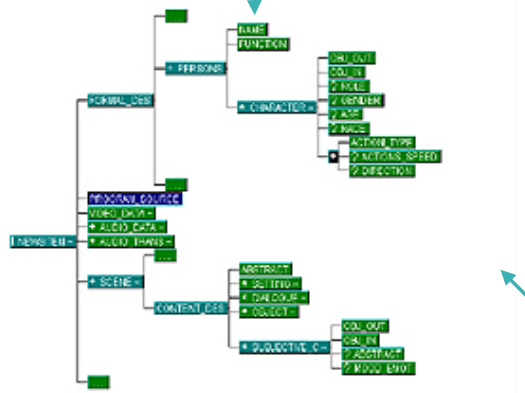
Sign II ← value { Social codes, Syntagmatic codes, Paradigmatic codes

↓

Sign III
(valued signifier and signified)

Image – Description methods





" Legend of Orpheus & Eurydice ", 2001, The Werner Collection .

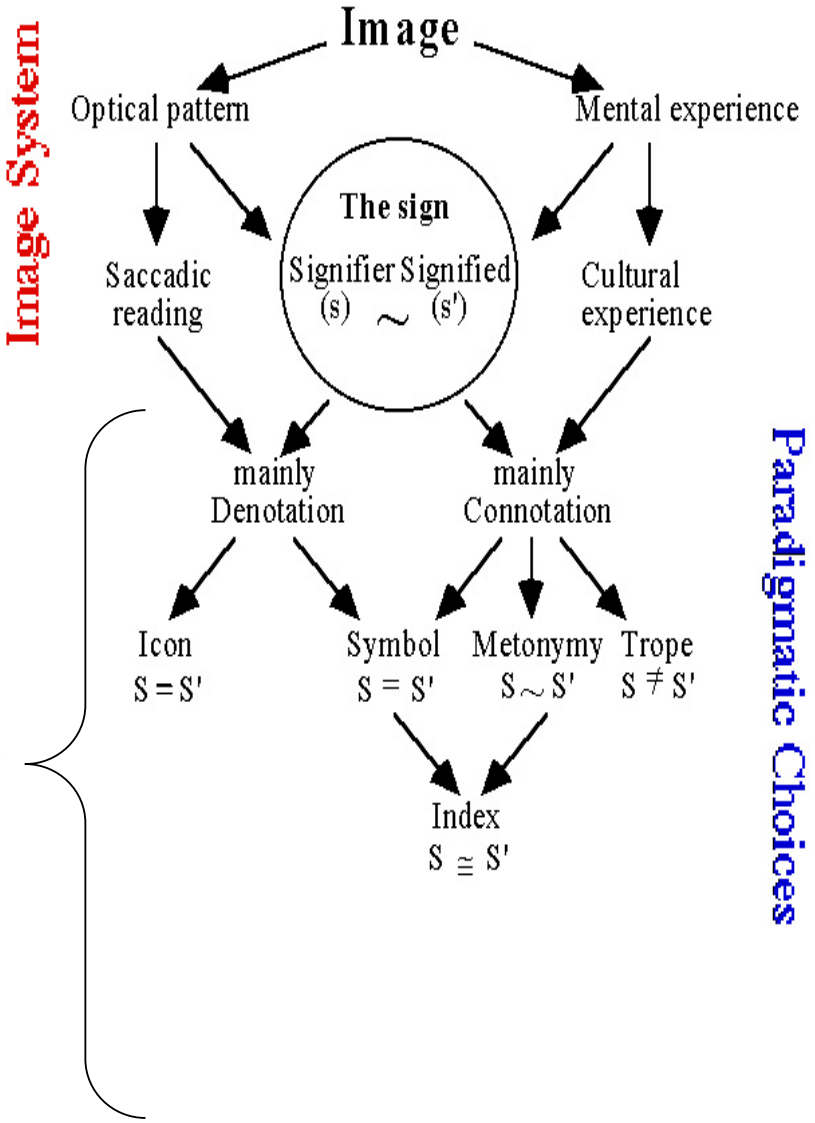
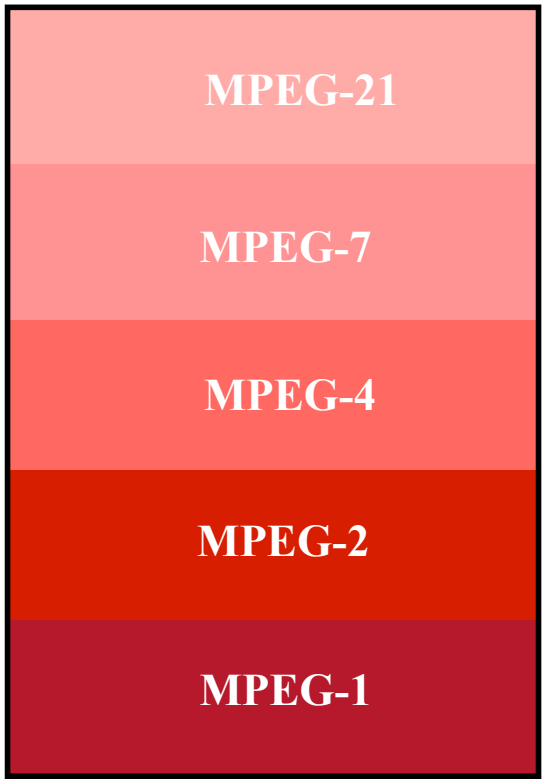
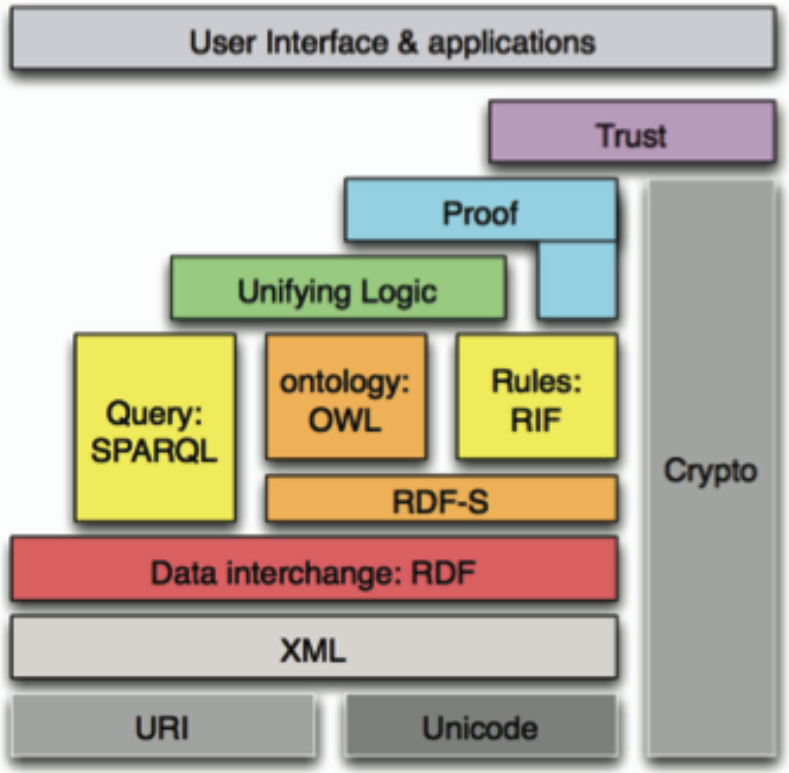


Image – Description methods

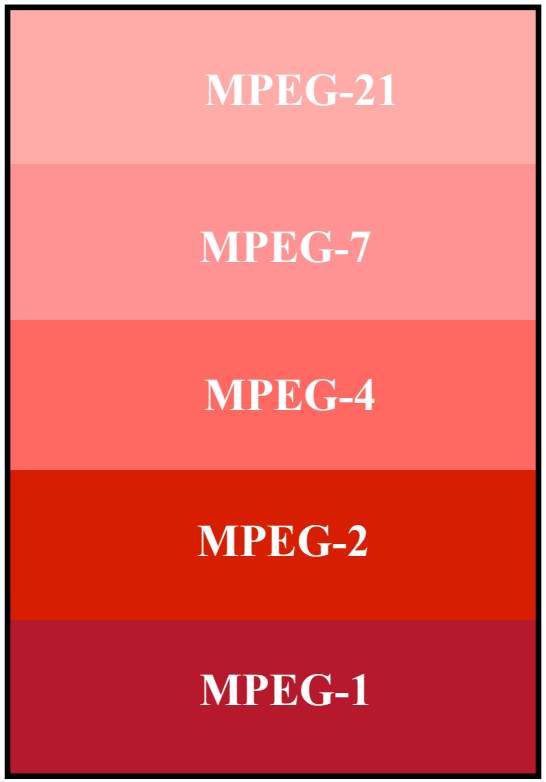


ISO



W3C

Image – Description methods



ISO

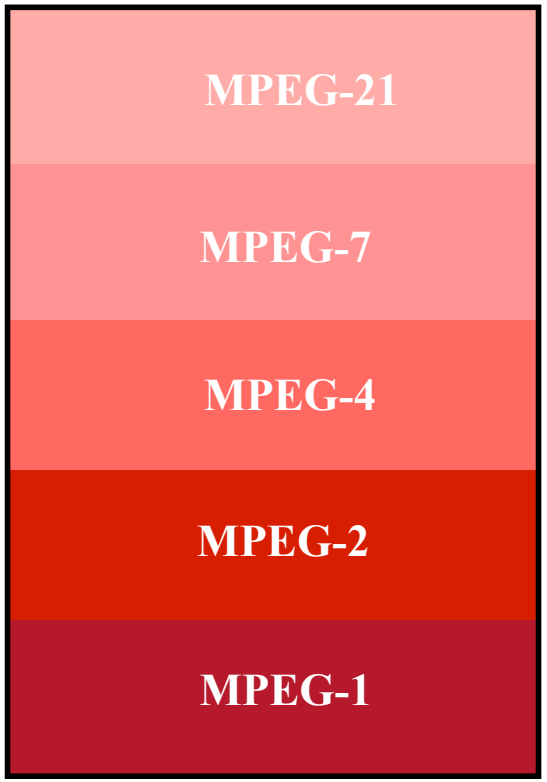
The **Moving Picture Experts Group**, commonly referred to as simply MPEG, is a working group of ISO/IEC charged with the development of video and audio encoding standards.

Support video/audio "objects", 3D content, low bitrate encoding and Digital Rights Management. Several new higher efficiency video standards.

Transport, video and audio standards for broadcast-quality television.

Initial video and audio compression standard. Later also the standard for Video CD, and MP3.

Image – Description methods

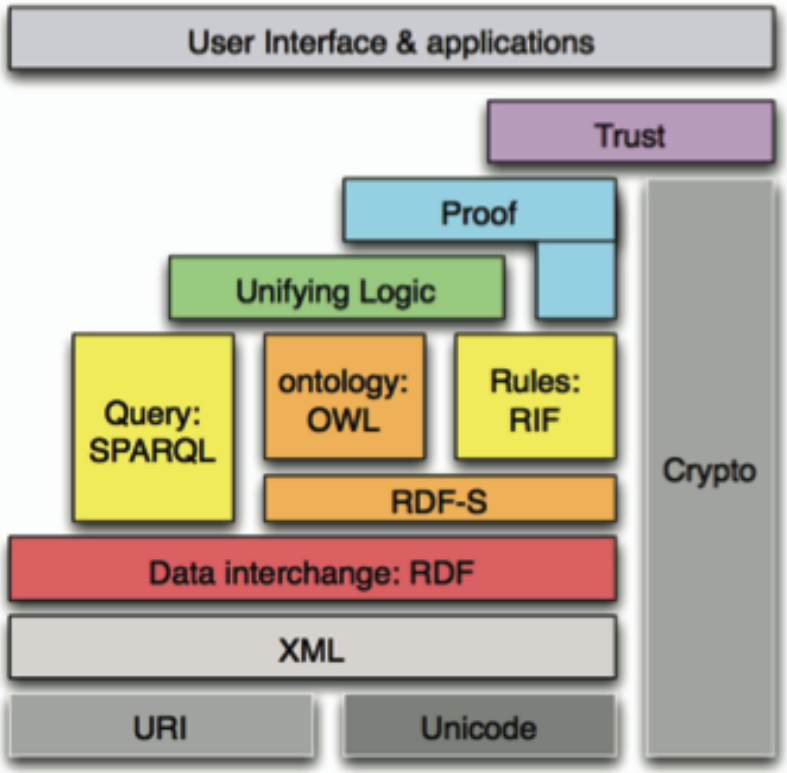


ISO

MPEG describes this standard as a multimedia framework.

A multimedia content description standard.

Image – Description methods



W3C

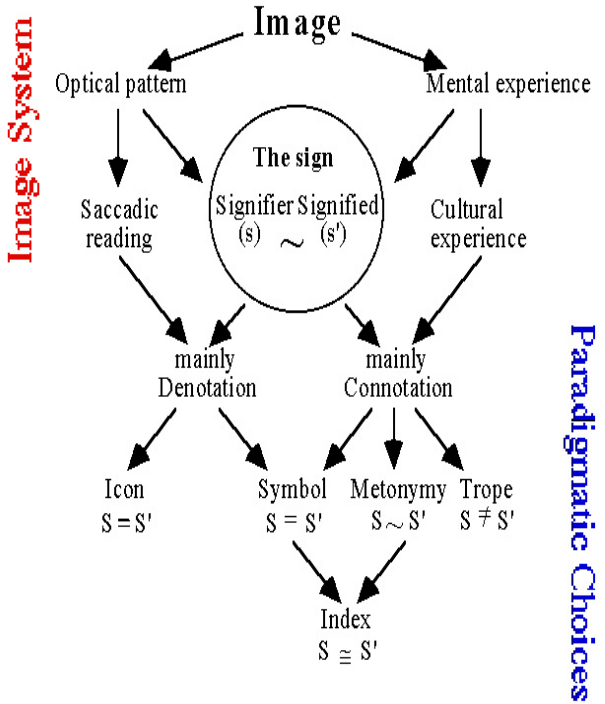
The goals of the Multimedia Semantics Incubator Group is to explain the advantages of using Semantic Web languages and technologies for the creation, storage, manipulation, interchange and processing of image metadata.

In addition, it provides guidelines for Semantic Web-based image annotation, illustrated by use cases.

Relevant RDF and OWL vocabularies are discussed, along with a short overview of publicly available tools.

http://www.w3.org/2005/Incubator/mmsem/

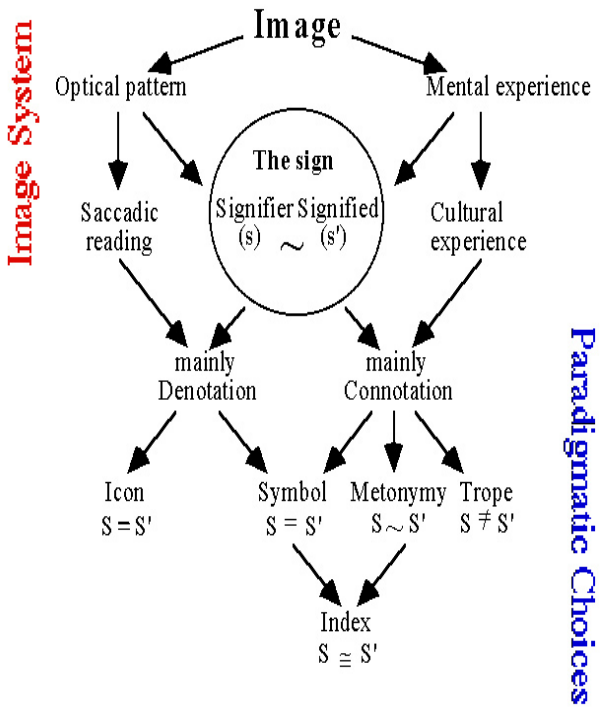
Image – a sign system summary



An image is a a dominantly **iconic** sign system, proposing a union in relation to reality.

The **denotative** power of an image, the optical pattern, communicates a precise knowledge, which releases the audience from the process of decision making but leaves a **problem of interpretation** (signification process).

Image – a sign system summary II



Representing an Image in a media-based system:

Conceptual models for:

- quantitative or qualitative characterization of optical pattern (feature extraction (colour, texture, light, angle, etc.), pattern recognition (line, shape region, etc.), multi-scale signal analysis, ...)
- Spatial dimensions

=> textual metadata

- Semantics (e.g. taxonomy, thesaurus, ontology, etc.)
- Semantic markers (key word, tag, schema, ...)

to express higher semantics , such as forms, styles, genres, aesthetics, social codes.

Interpretation depends on the task:

- Search (e.g. retrieval by example)
- Generation (e.g. Qualitative support on features and higher semantics)
- Presentation (e.g. browsing through collage)
- Automatic art generation

Image – Applications I

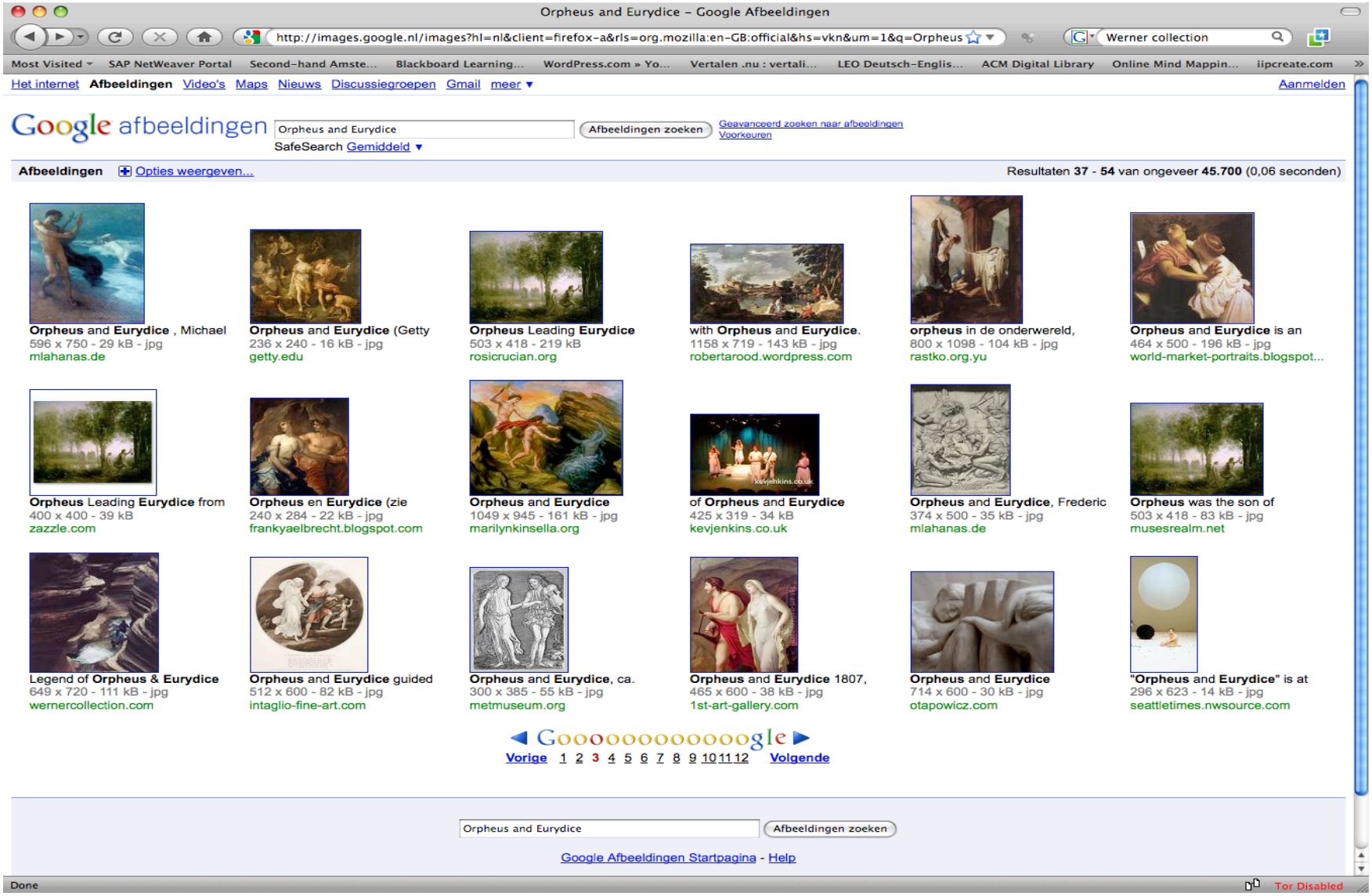


Image – Applications II

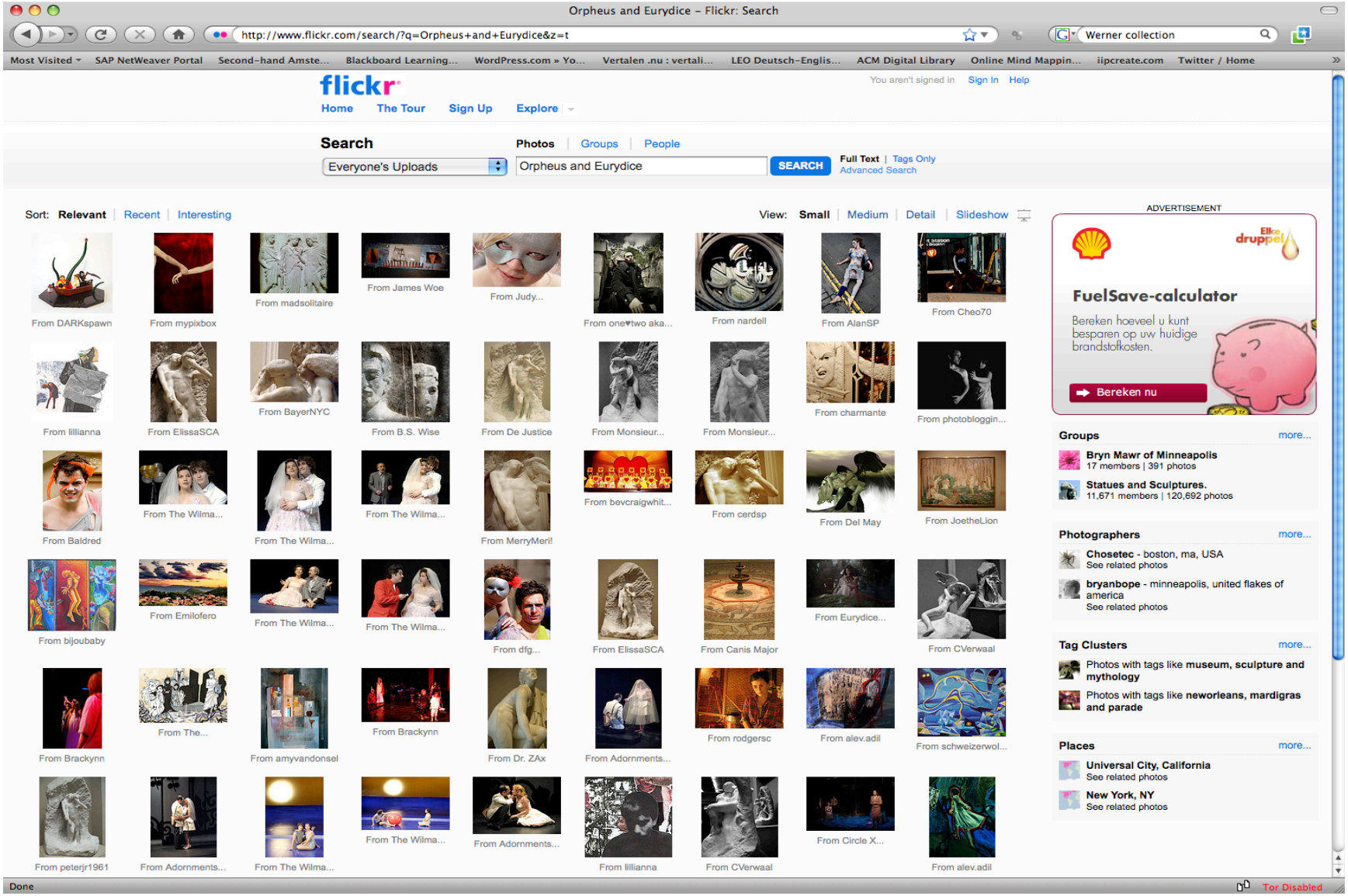


Image – Applications III

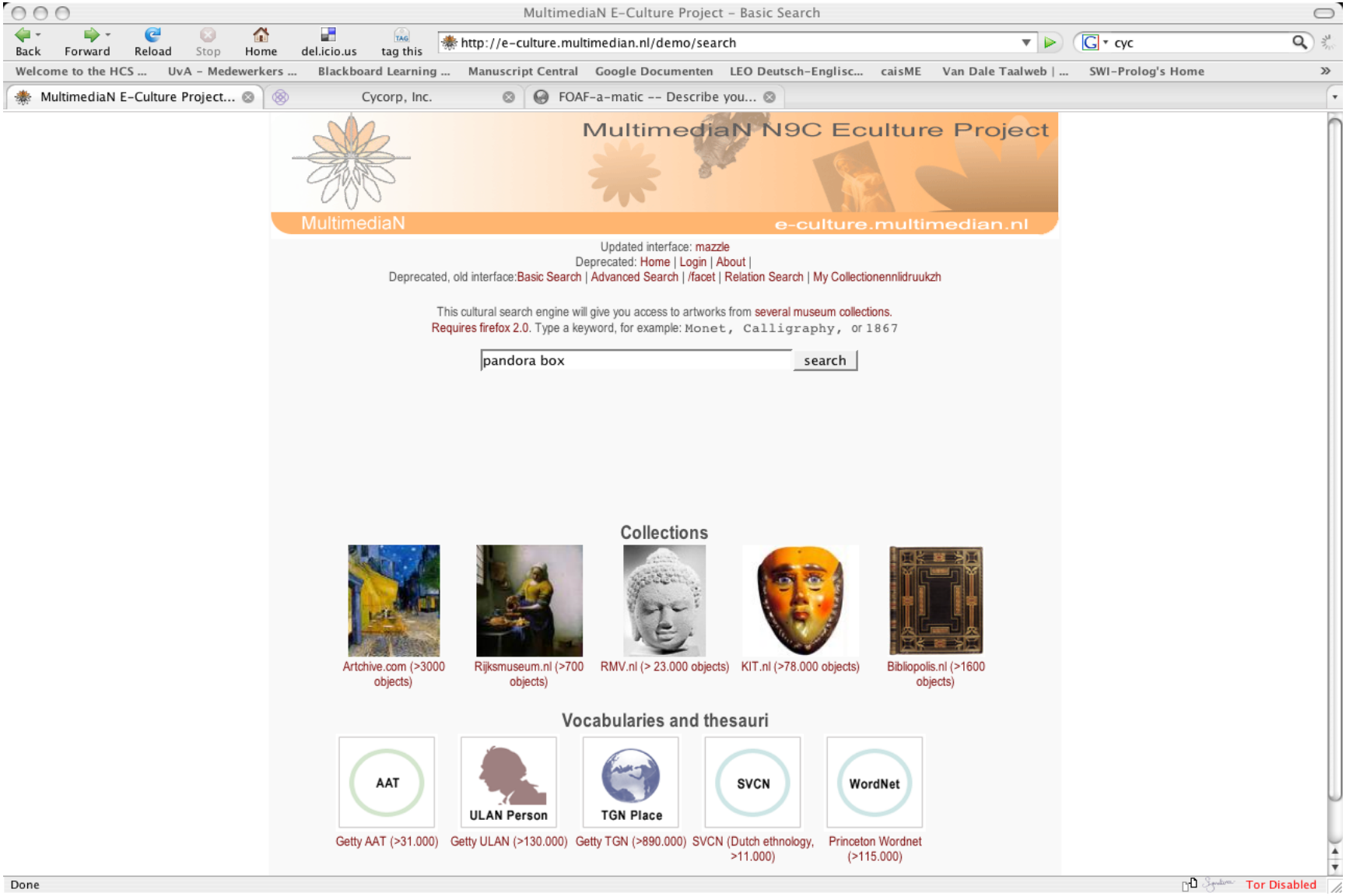


Image – Applications VI a

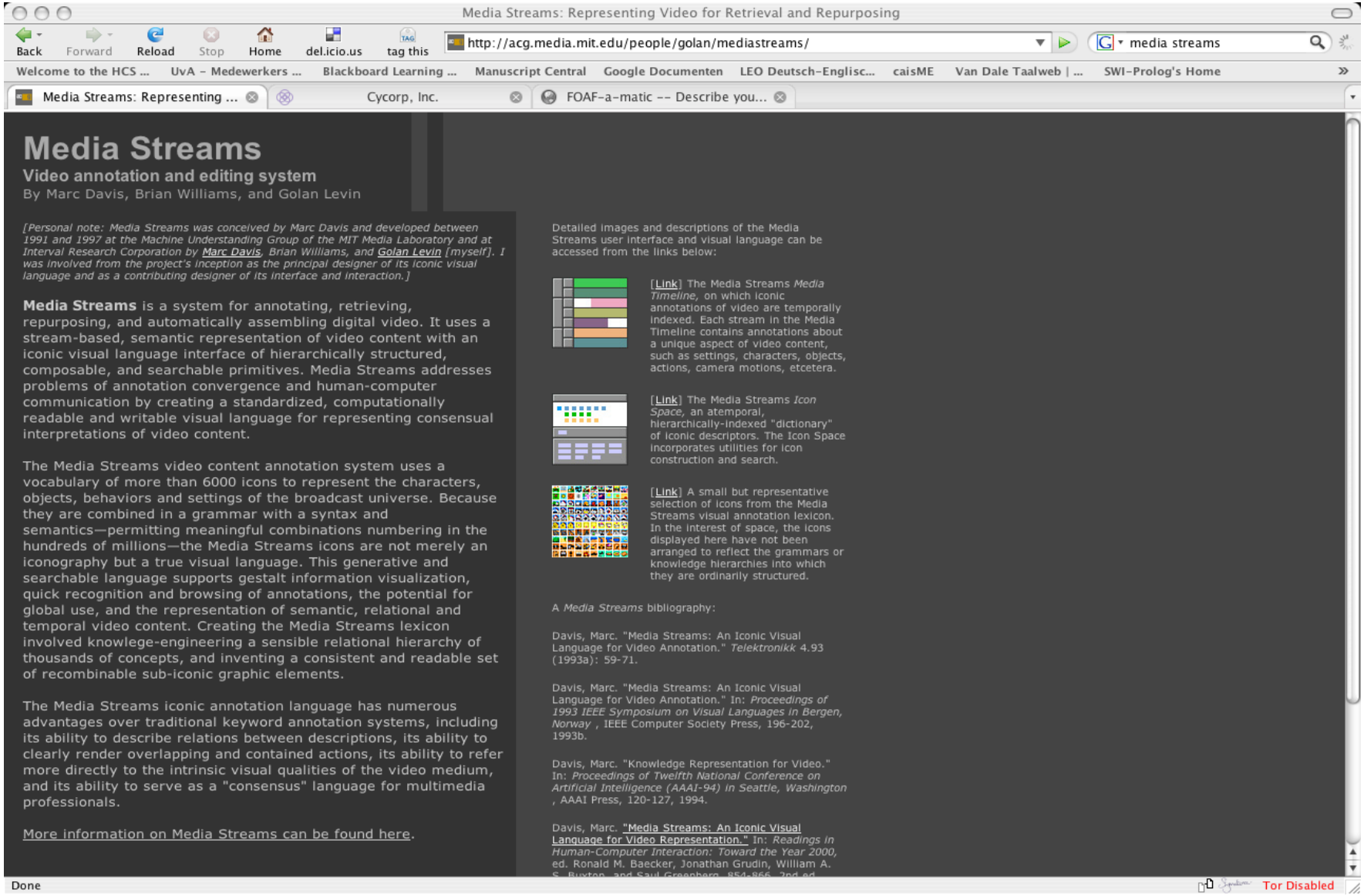
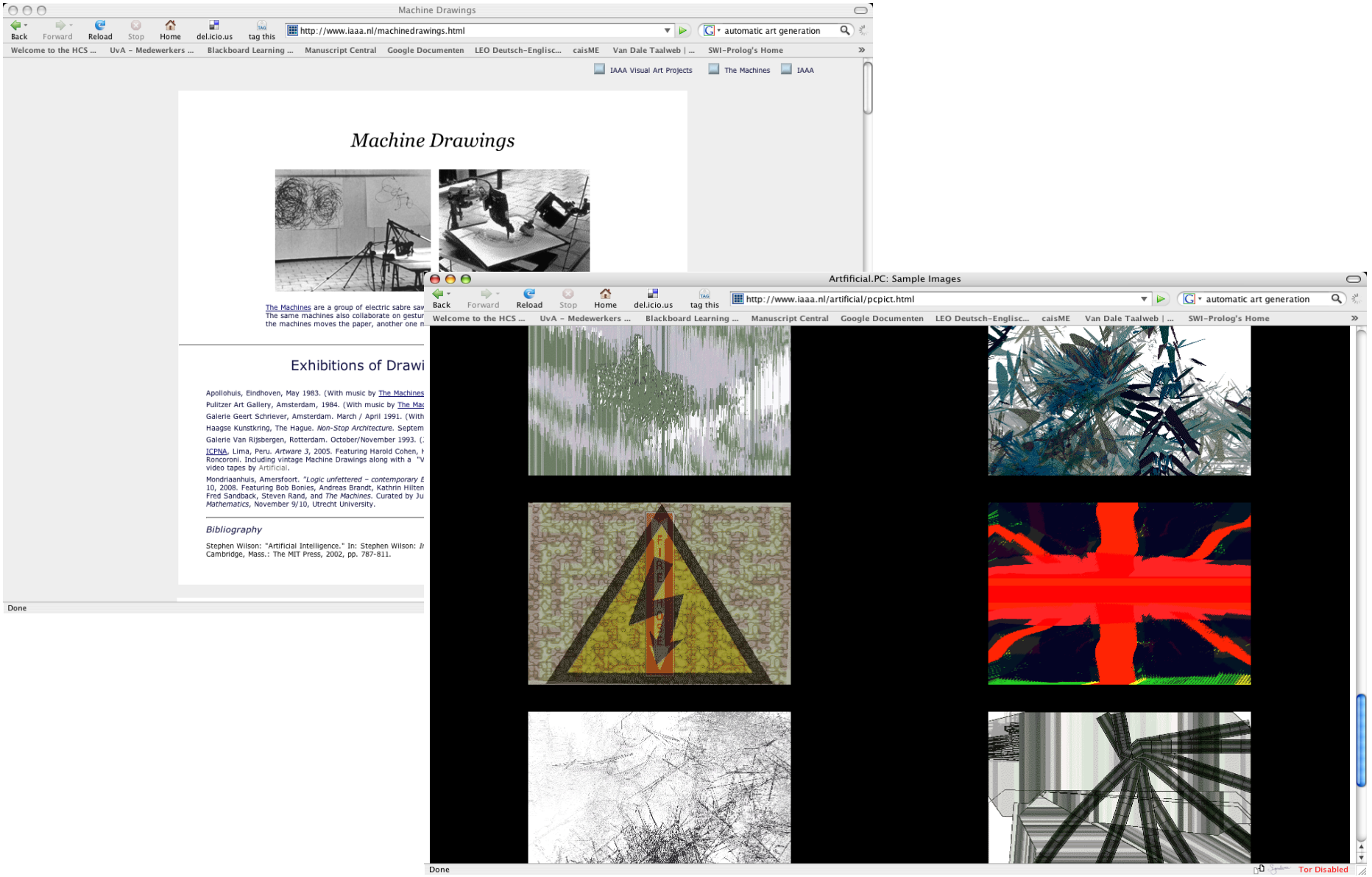


Image – Applications IV b

http://acg.media.mit.edu/people/golan/mediastreams/

Image – Applications V a

Image – Applications V b



Text and Image – summary

Both text and images refer to the same modality and domain knowledge but they establish different sign systems.

Both differ on the denotative level of signification.

Both differ on their paradicmatic processes.

Text can be used for text to provide metadata (sematic representations) in automatic processes.

Images rely on textual metadata to facilitate automatic processes on the 2nd and 3rd level of signification => mixed processes and representation structures.