

Lessons Learned From Research on Multimedia Summarization

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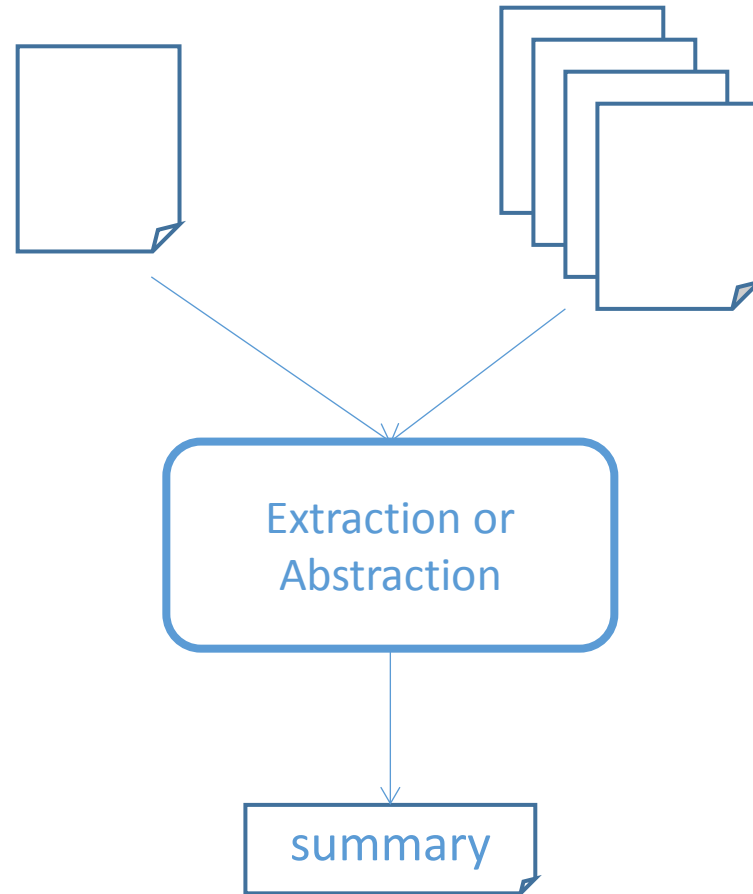
“Cartographic generalization is the equivalent of *text summary* as it:

- reduces the level of detail,
- highlights the important features given a user need,
- Preserves the main characteristics of the initial data”

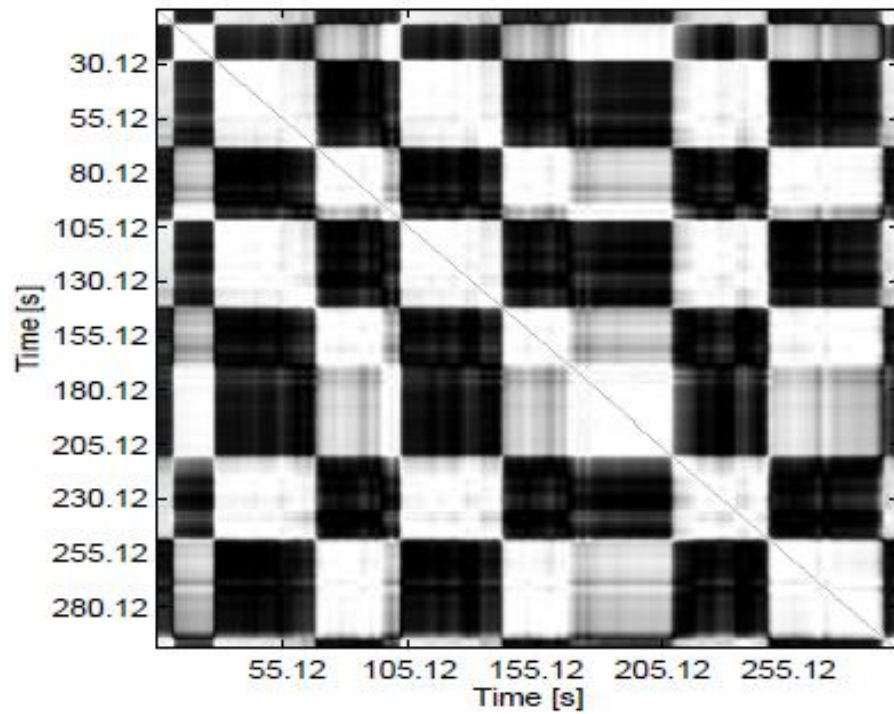
[Ruas 2002]

Is the similarity extendible to the automation
of these processes ?

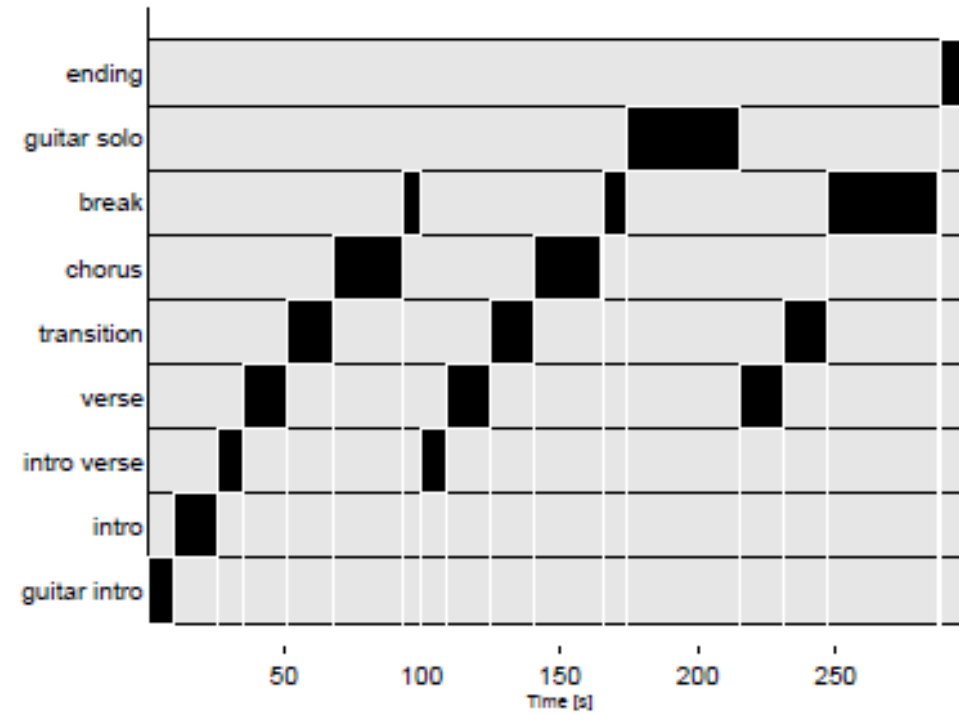
Text summarization



Music summarization



"Smells Like Teen Spirit" by Nirvana



[Peeters 2004]

Video summarization



Key Frames



Text summarization

Music summarization

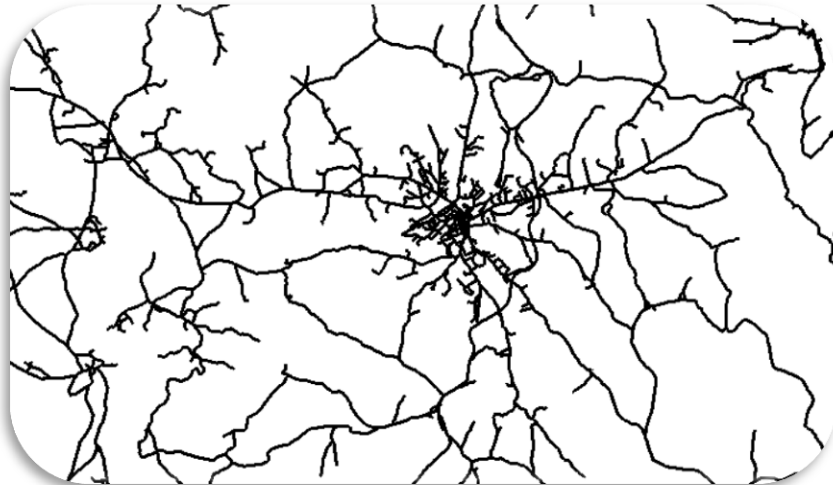
Video summarization



Multimedia summarization

Similarities and differences with generalization

Selection is a key process



[Touya 2010]

SCIENCE IN REVIEW

Chemistry Is Employed in a Search for New Methods to Conquer Mental Illness

By ROBERT K. PLUMB

By coincidence this week-end in New York City marks the end of the annual meeting of the American Psychological Association and the beginning of the annual meeting of the American Chemical Society.

Psychologists and chemists have never had so much in common as they now have in new studies of the chemical basis for human behavior. Exciting new finds in this field were also discussed last week in Iowa City, Iowa, at the annual meeting of the American Physiological Society and at Zurich, Switzerland, at the Second International Congress for Psychiatry.

Two major recent developments have called the attention of chemists, physiologists, physicists and other scientists to mental diseases: It has been found that extremely minute quantities of chemicals can induce hallucinations and bizarre psychic disturbances in normal people, and mood-altering drugs (tranquillizers, for instance) have made long-institutionalized people amenable to therapy.

Money to finance research on the physical factors in mental illness is being made available. Progress has been achieved toward the understanding of the chemistry of the brain. New goals are in sight.

At the psychiatrists' meeting in Zurich last week, four New York City physicians urged their colleagues to broaden their concept of "mental disease," and to probe more deeply into the chemistry and metabolism of the human body for answers to mental disorders and their prevention.

Blood May Tell

Dr. Felix Marti-Ibanez and three brothers, Dr. Mortimer D. Sackler,

Dr. Raymond R. Sackler and Dr. Arthur M. Sackler cited evidence that the blood chemistry of victims of schizophrenia is different from that of normal people. Perhaps multiple biological factors are responsible for this chemical change, they suggested.

Mental disease is a "developmental process" and long duration of a disorder may result in "permanent alteration of anatomy and physiology," they said. They urged that trials of new drugs which affect the brain should be concentrated on complex studies of the mechanism of action of the drugs. The variety of substances capable of producing profound mental effects is a new armory of weapons for use in investigating biological mechanisms underlying mental disease, they said.

The sources of behavioral disturbance are many and they may come from external as well as internal forces, the four reported. This concept has already proven practical, for instances, when it enabled psychiatrists to predict that the administration of ACTH and cortisone could produce psychosis.

"It led some years ago to the development of a blood test which was 80 per cent accurate in the identification of schizophrenic patients," they said. "It permitted us on physiologic grounds to deny that the psychoneuroses and the psychoses were lesser and greater degrees of the same disease process, and, in fact, to affirm that they represented opposite and even mutually exclusive directions of physiologic disturbances," they said.

Chemicals now available should be used not only to bring relief to the mentally sick but also to uncover

the biological mechanisms of the disease processes themselves. "Only then will the metabolic era mature and bring to fruition man's long hoped for salvation from the ravages of mental disease," they reported.

Chemistry of the Brain

At the psychologist's meeting here, a technique for tracing electrical activity in specific portions of the animal brain was described by researchers from the University of California at Los Angeles. They reported that deep brain implants in cat brains were used to record electrical discharges created as the animals respond to stimulations to which they had been conditioned. In this way the California group reported, it is possible to track the sequence in which the brain brings its various parts into play in learning. Specific areas of memory in the brain may be located. Furthermore, the electrical pathways so traced out can be blocked temporarily by the use of chemicals. This poses new possibilities for studying brain chemistry changes in health and sickness and their alleviation, the California researchers emphasized.

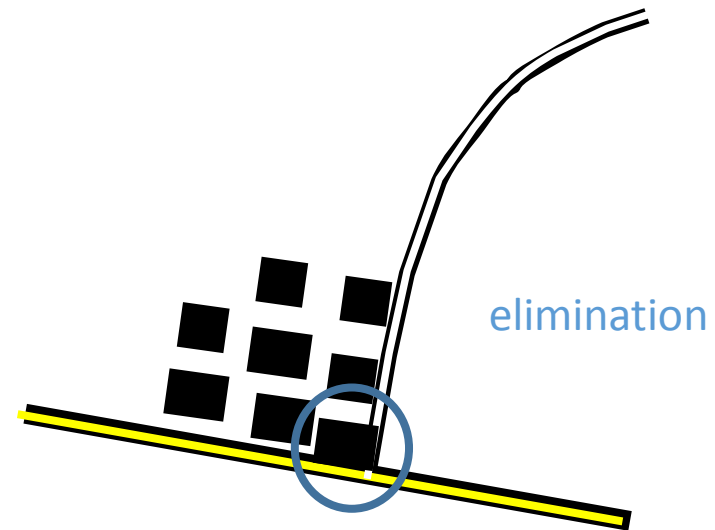
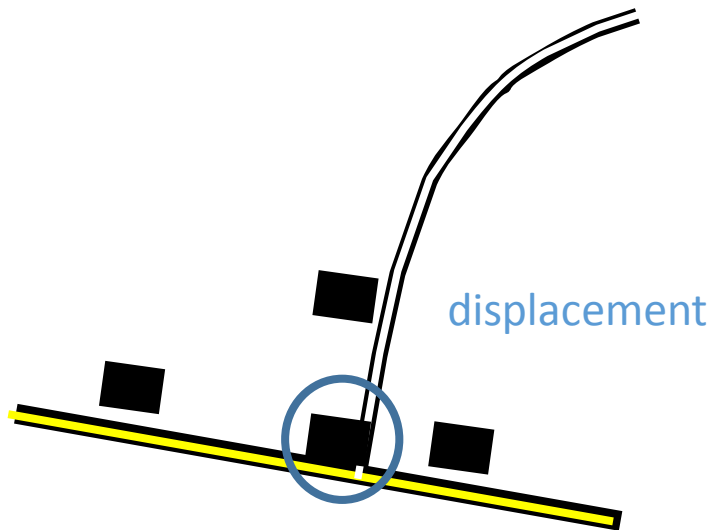
The new studies of brain chemistry have provided practical therapeutic results and tremendous encouragement to those who must care for mental patients. One evidence that knowledge in the interdisciplinary field is accumulating fast came last week in an announcement from Washington.

This was the establishment by the National Institute of Mental Health of a clearing house of information on psychopharmacology. Literature in the field will be classified and coded so that staff members can answer a wide variety of technical and scientific questions. People working in the field are invited to send three copies of papers or other material—even informal letters describing work they may have in progress—to the Technical Information Unit of the center in Silver Spring, Md.

[Luhn 1958]

Context is fundamental for decision making

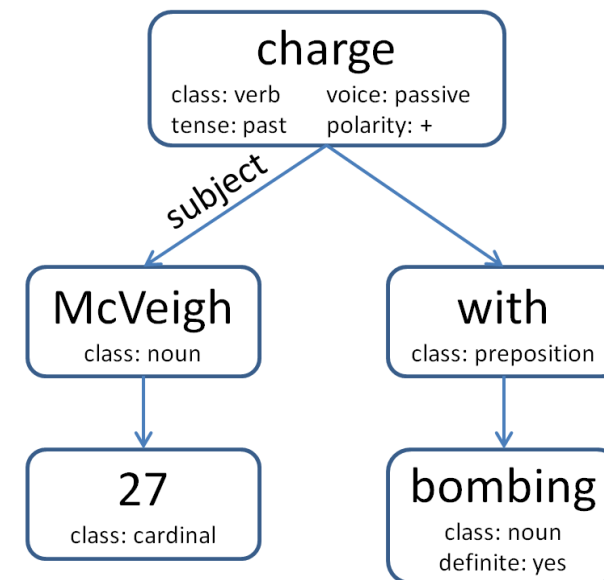
*“Bob got a new Stetson. He loves **the hat.**”*



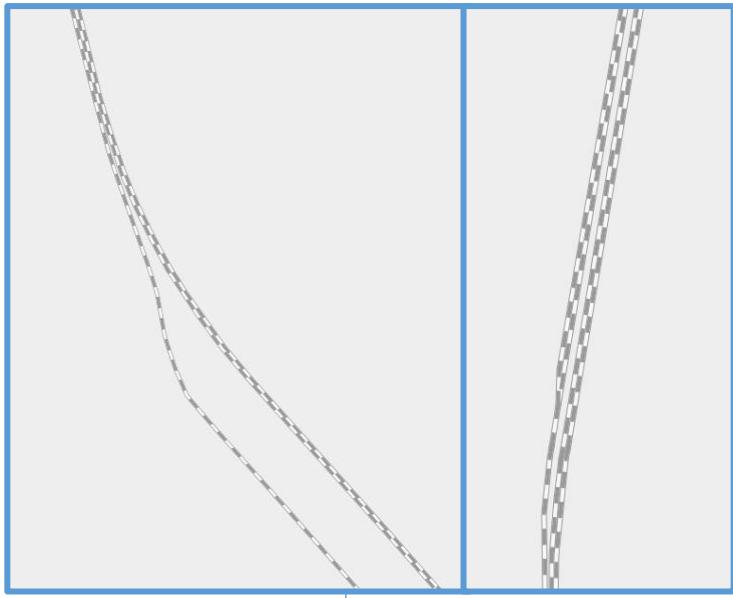
- T-nodes
- ▼ Fork-nodes
- y-nodes
- ✚ cross-nodes



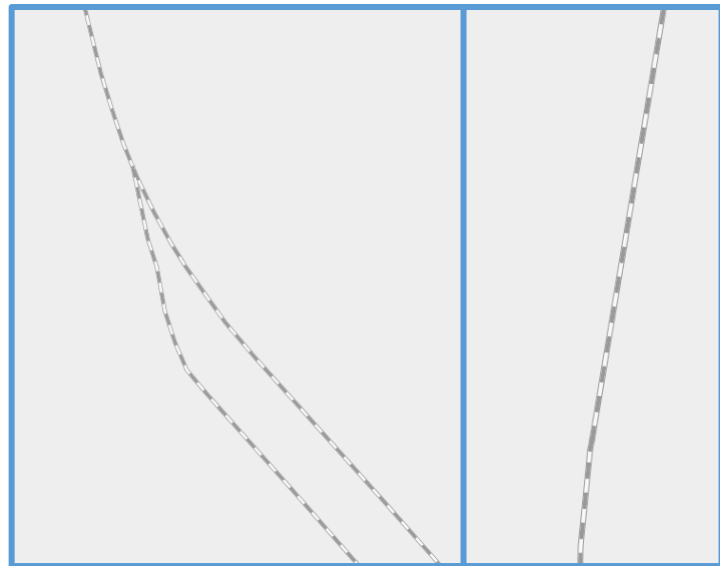
Geographical structures



Grammatical structures



Geometrical transformations



[Savino & Touya 2015]

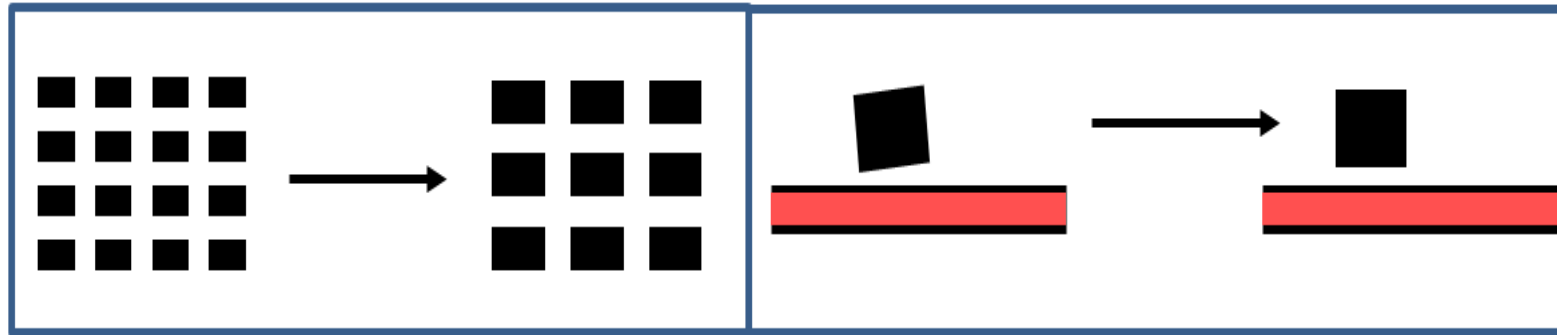
“walk to the refuge south of Lake Grattaleu”



Natural language processing



{{Walk,.motionVerb+median} to {{the refuge,.commonNoun}
{{south,. Directional} of,.indirection} {Lake
Grattaleu,.toponymCandidat} ,.ESNE},.Vto}



Typification and exaggeration operations



Information reduction is guided by legibility/eye perception

What can we learn from automatic
summarization?

1.The notions of importance and redundancy



“yet in automated cartography, there are no models that enable contextualising content to be selected based on the choice of **salient** information”

[Mackaness & Gould 2014]

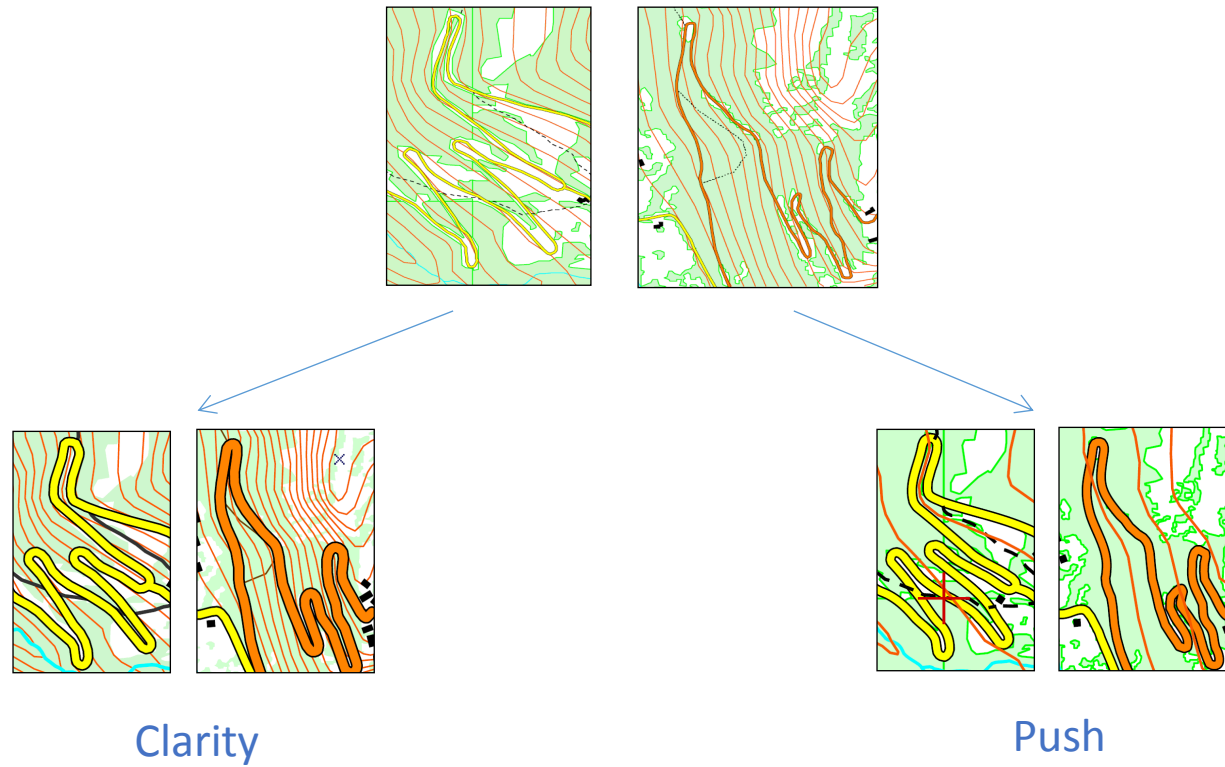
2. A massive use of machine learning



[Burghardt & Neun 2006]

3. Major focus on evaluation

3. Major focus on evaluation



[Lin 2004]

4. Benchmarks to encourage comparisons



Scale gap



Topographic map



VGI as source



Online map

Constraints

Thematic map

Landscape

Paper map

Small device

4. Benchmarks to encourage comparisons



Organization of a workshop on benchmarks?

What about visual search research?

What about graph bundling/visualization research?

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Thanks!