Call for Papers:

Workshop

What Is a Structural Data Representation?

Emerging Concepts of Structural Representation

Date: August 13–14, 2014

Place: Delta Fredericton (overlooking St. John River), Fredericton, NB, Canada

Dust off your wildest idea and/or application on structural representation, submit the paper, and be prepared to be really surprised! Keep in mind: *no theory can 'recover' the information that cannot be captured* by the original form of data representation.

We have several ambitious objectives:

- to address scientifically new and strategic question:

  how do we approach the subject of a *general* formalism for structural representation**,** i.e. which structural 'units' should take place of numbers? (e.g. structured events?)

- to discuss *the necessary* characteristics of a satisfactory candidate formalism for structural representation:
  - one of the main characteristics is the capability of the formalism to support the presently non-existent but actually *the central informational concept of* ***class*** (of 'similarly' structured objects), which is most likely defined by the *generative* ***class representation***, where "generative" means "generating all class members and *only them*";
  - moreover, for such class representation to be reliably *learnable*, the object representation must carry *explicitly the generative object structure*, i.e. how the agent perceives *the structural generation* of the object;

- to draw attention to the present situation: are the popular "structural" representations, indeed, structural representations?

- to address the applied implications of various approaches to structural representation.

Accordingly, the popular string (graph) is not an adequate example of structural representation, since it does not carry the necessary *generative information* (as to how it was 'generated'). It is this *representational 'incompleteness'* of the string (graph) that is the reason why most grammar learning problems—even for relatively simple classes of grammars—are intrinsically ambiguous and computationally intractable.

Not surprisingly, to capture, *non-artificially*, adequate generative information as part of object representation, fundamentally new representational means are needed (e.g. *structured events*). There is, at least, one example of such formalism developed recently (ETS; for a general introduction, see ETS1 and the developing book).

The point to emphasize is this: if a structural object representation doesn't capture an *entirely new view of an object, inaccessible to the numeric representations,* it cannot be seriously considered as an alternative to the latter, since it would only be a *superficially* new form of representation (hence the need for new representational means).

There are, indeed, initial efforts involved in the development of structural representations, but once developed, they should open up, without any exaggeration, a *completely new era* in information processing—including data mining and search engines—and in science in general. Why? To take just one example, for the first time, all applied fields will be able to exploit a fundamentally new, powerful concept of *class representation*, the concept that has not and could not have emerged within the conventional, numeric, formalisms. Note that, paradoxically, so far, numerous data analysis fields, including data mining and machine learning, have been *engaged in classification without the concept of class available to them*!

One of the emphases of the workshop is on the implications of the structural data representation to *various* areas, including, but not limited, to machine learning, search engines, data mining, and computer vision.

There will be an hour-long opening talk clarifying the above issues, as well as the concluding general discussion.

Program Committee:

Chair: Lev Goldfarb (*Inductive Information Systems*)

David Gay, Software Engineer (*Google*)
Oleg Golubitsky, Software Engineer (*Google*)
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Kaleem Siddiqi (*School of Computer Science and Centre for Intelligent Machines, McGill University*)

(+ others pending)

You are invited to submit original papers addressing the issue of structural representation ***in any*** *of the applied or theoretical contexts*. Please follow the available ICPR LaTeX , Word templates (8 pages maximum, 8.5" x 11" page size) and submit your manuscript electronically in PDF format to goldfarb@unb.ca by March 10, 2014.

Submitted papers will be evaluated based on their quality and relevance. Once a paper has been accepted, at least one of the authors—non-student, *if* there is such among the authors—must register *before* submitting the final manuscript (otherwise the paper will not appear in the proceedings). A special issue of Pattern Recognition or Pattern Recognition Letters on "Structural Representation", based on the selection of the accepted papers, is planned.

To help with the panning and arrangements, it would be greatly appreciated if you could inform goldfarb@unb.ca, at your earliest convenience, about your *intention* to attend the workshop.

The workshop's website is http://www.cs.unb.ca/~goldfarb/SR_Workshop.pdf

Relevant dates:

Original submission deadline	10 March 2014
Author(s) notification	20 April 2014
Camera-ready paper (PDF)	15 May 2014
Workshop	13–14 August 2014