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EDITORIAL: CONTEXT IN CONTEXT

". . . sins of noncontextuality . . ."
– Goffman (1981, p. 32)

The development of models and techniques that utilize context-related ideas have been driven, to a large extent, by the understandable failure of generic approaches. When people act in a certain way or say a particular thing, they do so in a context. As a result, in all the things that they do or say there are embedded background assumptions available only through the context. In the past, the importance of this background has not been sufficiently emphasized – it has been thought that going for the most general model is desirable and that context-dependency is something to be avoided as much as possible. However, recently it has been appreciated that the explicit recognition of context and its use in the manipulation of knowledge can be useful.

While recognizing that context is important is surely something in the right direction, this does not immediately give one clues as to how it must be represented. In natural language, meaning is definitely context-bound, but context is not bounded. To quote Derrida (1979, p. 81), "[N]o meaning can be determined out of context, but no context permits saturation" [Note 1]. This discouraging aspect of language meaning gives rise to interesting puzzles in interpretation. Thus, Culler (1983, p. 124) observes that "any attempt to codify context can always be grafted onto the context it sought to describe, yielding a new context which escapes the previous formulation" [Note 2].

Is it possible to take a more practical approach? Can we decline to answer the question "What is *in* a context?" and still do useful work? At least some people think so. In Artificial Intelligence (AI), context was introduced by McCarthy (1987) specifically with the aim of solving the riddle of *generality*, viz. finding solutions to assorted

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problems – solutions that are independent of the problem domain. McCarthy leaves context as a rich yet undefined notion and notes that humans are quite good at using it. He thinks that we seem to be constantly (and efficiently) shifting between contexts and lifting information from one context to another. This results in powerful ways of transferring knowledge from learning to application – ways which seem to avoid long chains of explicit inference. The basic advice of McCarthy is to devise knowledge bases of common sense information that could be put to use by programs.

Influenced by McCarthy's work, the CYC team (Cycorp, 2001) is presently occupied with developing context-like notions in order to produce a unitary ontology to endow future computers with common sense (Lenat, 1998). In machine learning, algorithms have been augmented in order to try and identify when a more radical adaptation is required (Brézillon, 1999). In natural language processing, context has long been used as a proxy for any necessary feature of understanding that cannot be captured by a universal model, leading to models where some background (surrounding) detail is included (Asher and Lascarides, 1995). In all these fields, the idea is to broaden generality by explicitly including ideas of context.

This common motivation means that the afore-mentioned approaches are similar in two respects. First, their properties are specified using a top-down 'design stance.' Second, they assume that the appropriate notions of context are general (despite the fact that their existence is a tribute to the fact that the content they deal with is not). In other words, they involve essentially guessing at the properties of the relevant contexts without any recognition that these properties might themselves be context-specific.

In this special issue, we have tried to focus attention upon the opposite approach. We assume that the world is, to a large extent, a messy and contingent place. This means that the transfer of knowledge from the time of learning to the time of application via feasible models is *only* possible by a diverse collection of heuristics which exploit a heterogeneous set of commonalities which occur for a variety of reasons in different domains. The different heuristics involved in each case will lead to a different 'flavour' of context. Actually, we cannot specify the characteristics of contexts on an

a priori basis any more than we can the knowledge within the contexts.

The alternative approach is then this: search for *local* commonalities and heuristics in particular contexts and see how they can be utilised to produce useful techniques. Later, if these are useful, some careful and incremental generalisation might turn out to be possible. In this way, we can truly start to 'map out' the practical limits of generality using context-like constructs and maybe avoid deceiving ourselves with overambitious schemes which later fail to scale up.

This special issue includes half a dozen papers exemplifying the alternative approach. In the spirit of the above distinction, the papers that make up the special issue do *not* take idealized abstractions as their point of departure but rather start with the actual phenomena under study and later generalize. We agree that, more often than not, giving a formal model and providing a theory of a loaded notion – such as context – can lead to important insights. Thus, precise models of context and accompanying theories are useful. However, given the widely different fields, methodologies and worldviews within which people study, an approach that starts with the root phenomena/problems and only attempts normalization and generalization *post hoc* might be a more productive way to proceed. In this sense, the papers that make up the special issue embrace each other and deserve the general designation 'grassroots' [Note 3].

Half of the papers are empirical in their approach.

- Rouchier, O'Connor, and Requier-Desjardins' contribution, entitled "Building Context in Everyday Life," argues that rather than accepting a particular context in a social situation, people usually make a conscious effort to render it more opportune. The authors devise a social simulation framework to observe the behaviour of a group of autonomous agents vis-à-vis the process of building up of trust among them.
- Walczak's article, "A Context-Based Computational Model of Language Acquisition by Infants and Children," similarly uses a computer model to study the way children learn to use language. A program first collects segments of human discourse in order to create contexts analogous to the original contexts of speech.

- Heylighen and Dewaele define a crucial dimension of variation between the so-called 'high-context' and 'low-context' types of situations in their paper "Variation in the Contextuality of Language: An Empirical Measure." The former type of situation is highly context-dependent whereas the latter is more overt and explicit. The authors use a variety of data from four languages and propose an empirical measure that serves to differentiate the more contextual from the less contextual.

The remaining half of the papers address more or less conceptual issues.

- Perconti's "Context-Dependence in Human and Animal Communication" studies those characteristics of natural language also shared by the communication facilities of animals. Largely motivated by the influential work of Perry (1993) on indexicals, Perconti's philosophical arguments may have serious repercussions in psychology. For example, a bold thesis of this paper is that 'indexicality' is a characteristic, privileged only to natural language.
- Like Perconti, Bazzanella's concern is with a common indexical in her paper "The Significance of Context in Comprehension: The '*we* case'." She concludes that a full understanding of a use of *we* in a context is possible only when all the contextualization cues are taken to account.
- In "Micro Situations and Macro Structures: Natural-Language Communication and Context", Fetzer takes a sociocultural standpoint towards investigating the role of context in natural language communication. Her work is informed by Habermas (1989) whose theory of communicative action regards language as a medium of attaining understanding at the sociocultural stage of evolution. Communication, according to Habermas, presupposes a norm which demands intelligibility, truth, warrant, and sincerity, encapsulated by the ratification of 'validity claims.' Fetzer discusses the latter from the perspective of context.

With their fresh outlook and attendance to detail, we hope that these two groups of papers, both adopting the grassroots approach to contextualising practices, will help the reader in placing context in context.

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NOTES

1. Derrida's observations regarding context are found in his celebrated critique of J.L. Austin's speech act theory (Derrida, 1977).
2. This unboundedness of context leads, according to Scharfstein (1989, p. xiii), to a radical stance of *relativism*: the emphasis on context might make everything an absolute individual, because by attaching them to their contexts we underline their individuality and render them unique. Scharfstein's argument is a tricky one and cannot be done justice in this brief digression.
3. We have been obliged to use this oblique designation for the lack of a better term. Similar overtures have recently appeared in the literature; the reader is especially referred to (Mey, 2000) and (Dilley, 1999) for two exemplar studies.

REFERENCES

Akman, V.: 2000, Rethinking Context as a Social Construct, *Journal of Pragmatics* 32: 743–759.

Asher, N. and A. Lascarides: 1995, Lexical Disambiguation in a Discourse Context, *Journal of Semantics* 12: 69–108.

Brézillon, P.: 1999, Context in Human-Machine Problem Solving: A Survey, *Knowledge Engineering Review* 14, 1–37.

Culler, J.: 1983, *On Deconstruction: Theory and Criticism after Structuralism*. London: Routledge.

Cycorp: 2001, Makers of the CYC Knowledge Server for Artificial Intelligence-Based Common Sense, Austin, TX. Company web site http://www.cyc.com

Derrida, J.: 1977, Signature Event Context, *Glyph* 1: 172–197.

Derrida, J.: 1979, Living On: Border Lines. In H. Bloom et al. (eds.), *Deconstruction and Criticism*. New York: Seabury, 75–175.

Dilley, R.: 1999, The Problem of Context. In R. Dilley (ed.), *The Problem of Context*. New York: Berghahn Books, 1–46.

Duranti, A.: 1997, *Linguistic Anthropology*. Cambridge, UK: Cambridge University Press.

Edmonds, B.: 1999, The Pragmatic Roots of Context. In P. Bouquet et al. (eds.), *Modeling and Using Context: Second International and Interdisciplinary Conference, CONTEXT'99, Trento, Italy, Proceedings*. Lecture Notes in Artificial Intelligence, No. 1688, Berlin: Springer, 119–132.

Goffman, E.: 1981, *Forms of Talk*. Philadelphia: University of Pennsylvania Press.

Habermas, J.: 1998, *On the Pragmatics of Communication.* Cambridge, MA: MIT Press.

Lenat, D.B.: 1998, From 2001 to 2001: Common Sense and the Mind of HAL. In D.G. Stork (ed.), *HAL's Legacy: 2001's Computer as Dream and Reality*. Cambridge, MA: MIT Press.

McCarthy, J.: 1987, Generality in Artificial Intelligence, *Communications of the ACM* 30, 1030–1035.

Mey, J.L.: 2000, *When Voices Clash: A Study in Literary Pragmatics*. Berlin: Mouton de Gruyter.

Perry, J.: 1993, *The Problem of the Essential Indexical and Other Essays*. New York: Oxford University Press.

Scharfstein, B.-A.: 1989, *The Dilemma of Context*. New York: New York University Press.

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