

Statement of Interest: Leona F. Fass

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We have interest in Ontologies for the Semantic Web with a theoretician's perspective on knowledge representation and system design, and a practitioner's perspective on actual web access. We believe that the research emphases associated with semantic web development will result in improved web access in the Real World.

Much of our recent theoretically oriented research has examined software design processes, including feasibility of system verification and testing. In connection with this work we have experimented with deployed systems and informational domains, to analyze their structure and detect possible design flaws. Our goal has not been to befuddle or baffle a system but, rather, to discover inevitable defects that might be corrected, producing a better system as a result.

Now, most of our web access and interaction with deployed systems has been on public machines at the library, in the Village of Carmel-by-the-Sea where we reside. This environment is very different from that of an industrial high-tech laboratory, academic department or even a university library. As we access the web to do our searches and experiments, our next-terminal neighbors may be 8-year-olds, movie stars, mystery writers, marine ecologists or salespeople in tee-shirt stores. Furthermore, the library staff these patrons may consult for web-access assistance are diversely educated, with expertise in Turkish, local history, gemology, etc. All have had recent training in necessary information science, but their library resources are not the same as our computer science resources. As the web evolves we each find new informational sources so that the library scientists and we constantly learn from each other. Meanwhile, as an everyday patron of the Village library we must contend with The Content Advisor, machine restrictions and inexplicably blocked research sites.

This environment gives us the opportunity to observe web access processes and detection of flaws in the Real World and not just the theoretician's Ivory Tower. We see web interactions that may be very different from our own; means of making queries that are different from our own; and a different variety of results that (in our own experiments) we would never

expect. We see inconsistency of results obtained, depending on who's seeking the information, from whom, and when. Because of this we are fascinated by the prospect of a semantic web, which can resolve some of the problems and inconsistencies of web access encountered by everyday users in the Real World. Whether an 8-year-old or a movie star, we all need to do research of some variety, and (unless we are testing software systems) when we get an answer we would like it to be easily accessible, understandable, correct or, even, best.

Some of the obstacles to be overcome by components of the semantic web -- e.g., for language processing, link analysis and inferencing -- are quite obvious to us, as we make our own logical, precise queries and obtain unexpected results. For example, asking Jeeves for references on Finite Model Theory and getting references to modeling agencies and acting schools! Asking Orbitz to price a research trip MRY-RDU-YYZ-MRY, and being annoyed *and* impressed by its response: routing us to Ontario, California rather than our specified YYZ Toronto, Canada stop. (Since there is not yet a semantic web to automate composition of web services, *we* next tried `aa.com`, receiving a too-many-segments system error, and ultimately tried `ual.com`, which successfully routed, inexpensively priced, and booked the trip.)

However, we've observed Google *becoming smarter and overcoming* obstacles. For, when we asked "Is vanilla Kosher for Passover?" we received an Orthodox-to-Conservative *and* surprisingly educational reply: vanilla sugar is; vanilla extract isn't, because it is fermented. (*Still* the semantic web should be able to answer the *untransformed* natural language query: "How come, a couple of years ago Dannon lemon yogurt was marked 'Kosher for Passover' but Dannon vanilla yogurt wasn't?")

Our earlier research, in the area of grammatical inference gives us additional understanding of the extreme difficulty of developing resources for the semantic web. Although, in our theoretical research, we obtained *perfect* results for language representation and perfect techniques for exploiting structure to effect inferences, we could *never* characterize our techniques as

feasible or Real-World-applicable as they stand. The time required to effect our perfect inference is immense; the space needed to store just our syntactic structural representation of language is enormous. *Theoretically*, we have the facility to incorporate semantics or enlarge a lexicon, or to add compositional and/or logic-based rules. However, in *reality*, these results are useless, due to Real World constraints on memory-space and time. We would like to make our techniques more useful, even if we must relax our “perfect” standard, to apply our results to such Real World applications as semantic web design.

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Leona F. Fass received a B.S. in Mathematics and Science Education from Cornell University and an M.S.E. and Ph.D. in Computer and Information Science from the University of Pennsylvania. Prior to completing her Ph.D. she held research, administrative and/or teaching positions at Penn and Temple University. Since then she has been on the faculties of the University of California, Georgetown University, and the Naval Postgraduate School. Her research primarily has focused on language structure and processing; knowledge acquisition; and the general interactions of logic, language and computation. She has had particular interest in inductive inference processes and applications/adaptations of inference results to the practical domain.