Abstract: What makes texts cohesive (beyond being random word-sets), fit to
abstract and communicate ideas, emotions, descriptions, instructions? Grammatical cohesion bonds
together text. For example, the pair is semantically related under

cohesion is hard. It draws upon semantics and world-knowledge in millions minds.

Alternatively, civilization created repositories: dictionaries, data-corpora, etc, and
studies of political texts, speeches of prominent leaders, to extracts dominant themes,
general common knowledge. Results of this experiment were analyzed in statistically

Learning is evoked to build decision trees on these features, calibrated by the

Applications

Cluster Based Computation of Relational Joins

Abstract: The prevalence of large racks of interconnected processor nodes forces us to
take another look at how to exploit parallelism when taking the join of large relations.

Sometimes, there is a gain in total cost to be had by distributing pieces of each relation
to several different nodes and computing the join of several large relations at once. The
optimization problem is to pick the degree of replication of each relation, under the
constraint that the total number of compute-nodes is fixed. We set up this problem as a
nonlinear optimization and show that there is always a solution (which must be
approximated by rounding to the nearest integers). For some of the most common types of
join -- star joins and chain joins -- we give closed-form solutions to the optimization
problem. Finally, we point out that the join algorithm we propose can be implemented
using features already present in Hadoop, the open-source implementation of map-
reduce.

12:45 Lexical Cohesion in Texts - Extraction Methods andApplications

Eli Shamir, Hebrew University of Jerusalem

Abstract: What makes texts cohesive (beyond being random word-sets). fit to
communicate ideas, emotions, descriptions, instructions? Grammatical cohesion bonds are
easy to explicate (agreement rules, pronouns, conjunctions, syntax...). Lexical cohesion is hard. It
draws upon semantics and world-knowledge in millions minds. Alternatively, civilization created
repositories: dictionaries, data-corpora, etc, and modern technologies to process them quickly. We
designed an annotation task (experienced on 22 readers, 10 texts, 600-1200 words each), to give each new test
word an anchor link to a previous word, if the pair is semantically related, under general common knowledge.
Results of this experiment were analyzed in statistically novel way to extract a core of 1261 lexically cohesive pairs, on which there is a very
high agreement. This sizable text-based core proved useful, as Teacher’s “gold standard”, for designing automatic extraction of lexically cohesive pairs from texts, based on relevant features drawn from the text and the repositories together. Supervised Learning is evoked to build decision trees on these features, calibrated by the experimental core. Several other correlations and applications include (BBK et al.) studies of political texts, speeches of prominent leaders, to extracts dominant themes, beliefs, creeds and even typical metaphor styles

13:15 Lunch

14:00 Constraints, Graphs, Algebra, Logic, and Complexity

Moshe Vardi, Rice University

Abstract: A large class of problems in AI and other areas of computer science can
be viewed as constraint-satisfaction problems. This includes problems in database
query optimization, machine vision, belief maintenance, scheduling, temporal
reasoning, type reconstruction, graph theory, and satisfiability. All of these
problems can be recast as questions regarding the existence of homomorphisms
between two directed graphs. It is well-known that the constraint-satisfaction
problem is NP-complete. This motivated an extensive research program into identify tractable cases of constraint satisfaction. This research proceeds along two
major lines. The first line of research focuses on non-uniform constraint satisfaction, where the target graph is fixed. The goal is to identify those tragnet graphs that give rise to a tractable constraint-satisfaction problem. The second line of research focuses on identifying large classes of source graphs for which constraint-satisfaction is tractable. We show in this talk how tools from graph theory, universal algebra, logic, and complexity theory, shed light on the
tractability of constraint satisfaction

14:40 Modular Approach for Developing Robust Protocols

Danny Dolev, Hebrew University of Jerusalem

Abstract: A decade ago Robert L. Constable and his team proved the correctness of
Ensemble, a multi-layer group communication system using the Nuprl formal
system. In the talk we will present an expected constant number of rounds protocol
to synchronize nodes, despite Byzantine and transient faults. The protocol is
composed of a stack of modules that were developed in several fields of Computer
Science in the last couple of decades. Proving in a formal way the correctness of
the construction or of some components in it will be the next challenge for
Constable’s team.

15:20 Coffee

15:30 TBA

Amir Pnueli, Weizmann Institute of Science, NYU

Abstract: TBA

16:10 Proving Church’s Thesis

Nachum Dershowitz, Tel-Aviv University

Abstract: Church’s Thesis asserts that the only numeric functions that can be calculated by effective means are the recursive ones, which are the same (extensionally) as the Turing-computable numeric functions. Yuri Gurevich’s Abstract State Machine Theorem states that every classical algorithm is emulated (step by step) by an abstract state machine, which is a most generic model of
sequential computation. That theorem presupposes three natural postulates about
table function algorithms. By augmenting those postulates with an additional
requirement regarding basic operations, a natural axiomatization of computability
and a proof of Church’s Thesis obten, as Godel and others suggested may be
possible. (Joint work with Yuri Gurevich.)

16:50 Round Table Discussion:
The Future of Computing Science