Editorial

The *ACM Transactions on Computational Logic* (TOCL) is a new journal devoted to the research concerned with all uses of logic in the field of computer science. This area has a great tradition in computer science. Several researchers who earned the ACM Turing award have also contributed to this field, namely Edgar Codd (relational database systems), Stephen Cook (complexity of logical theories), Edsger W. Dijkstra, Robert W. Floyd, Tony Hoare, Amir Pnueli, and Dana Scott (program logics, program derivation and verification, programming languages semantics), Robin Milner (interactive theorem proving, concurrency calculi, and functional programming), and John McCarthy (functional programming and logics in AI).

Logic continues to play an important role in computer science and has permeated several of its areas, including artificial intelligence, computational complexity, database systems, and programming languages. New uses of logic arise in such fields as machine learning, database systems, program verification and specification, and automated deduction.

By launching TOCL, the ACM hopes to provide further impetus to this research field and to bring together the community of researchers who have been working in it.

You may ask "Why publish in TOCL?" With so many journals around, it is useful to summarize the advantages of publishing in TOCL:

—The papers are directly submitted to the area editors. They are all top researchers in their fields of expertise. This cuts one link in the refereeing process and ensures a competent handling of the submissions.

—The authors are allowed and encouraged to post their submissions first at the Computing Research Repository (CoRR)—`xxx.lanl.gov/archive/cs/intro.html`—freely available for subscribing, browsing, searching, and downloading of selected articles. CoRR opened, in cooperation with the ACM, in August 1998. It forms a part of the Los Alamos National Laboratory archives that have been widely used since 1992 by the physicists and mathematicians.

—The accepted papers are immediately and *freely* available through the home page of the journal—www.acm.org/tocl.

—The final, proofread versions of the papers enter the ACM Digital Library.

—Thanks to the low subscription price and the widespread use of the ACM Digital Library, the journal will be widely available worldwide, in particular among students.

And then there is the unavoidable question: "Do we need another journal?" After all, there are enough outlets for publishing papers in computer science. Here is my answer to this perennial question. First of all,

computer science evolves. New areas of research keep emerging, and the older ones—such as computational logic—grow and get reorganized. These changes warrant creation of new journals.

Moreover, in the past 10 years the prices of many scientific journals grew by a staggering rate, vastly above the consumer price index. This led to a dramatic decline in the quality of our libraries (e.g., see the article by Joseph J. Branin and Mary Case, "Reforming Scholarly Publishing in the Sciences: A Librarian Perspective," *Notices of the AMS*, Vol. 45, No. 4 (1988), pp. 475–486). By introducing new, inexpensive—and high-quality—journals we improve the situation by offering the authors cheaper outlets for their scientific work, by providing the libraries with viable alternatives to more expensive journals, and by setting an example for others to follow.

Declining costs of access to information have been a crucial factor in the progress of humanity. In the times when access to the Internet is practically free, ideally, scientific knowledge should be freely shared. CoRR is an example that this is feasible economically. The ACM journals and the ACM Digital Library come close to this ideal.

Finally, launching a new journal is a long and time-consuming process. In the case of TOCL many individuals made it possible. First of all, the area editors agreed to join this initiative long before the ACM Publications Board approved it. Gordon Plotkin and Wolfgang Thomas provided a crucial help in defining the final list of areas.

This inaugural issue of TOCL could appear only thanks to the authors who agreed to contribute to the journal, the editors who handled the submissions, numerous referees who took their precious time to review the submissions, Marco Aiello, the most helpful information director of TOCL, and the ACM staff who took this additional chore on their shoulders. I am most grateful to all these individuals and am proud to have had an opportunity to coordinate their efforts.

Further, the ACM Publications Board approved this journal proposal in spite of the fact that it was put forward by an individual backed by a group of people not linked with any Special Interest Group (SIG). During the discussions that followed, Publications Board member Joe Halpern emerged as an extremely helpful person whose "to-do" list has had at all times at most one item. Joe also made me aware of the importance of CoRR as a modern-age outlet for the cost-free sharing of scientific information.

Bill Arms, the past chairman of the ACM Publications Board, was most supportive in clarifying my responsibilities, stressing the importance of high quality of the ACM publications, and answering my numerous queries about various aspects of the ACM publishing process.

KRZYSZTOF R. APT
Editor-in-Chief

Editorial

This special issue of the ACM Transactions on Computational Logic (TOCL) is dedicated to Robert A. Kowalski, or as he is better known, to Bob Kowalski, on the occasion of his 60th birthday. Throughout his distinguished research career Bob has been interested in various forms of logic-based reasoning from the computer science point of view. This novel view of logic has had an impact on a number of areas, including programming languages, databases, artificial intelligence, natural language processing, and more recently machine learning.

In the late sixties and early seventies Bob contributed to the development of the theory of resolution by proposing a number of modifications to the original proposal of Alan Robinson. One of the notions that withstood the test of time is his and Hayes' concept of *semantic trees*. This research eventually led him to the seminal 1974 paper "Predicate Logic as a Programming Language" which is at the roots of the logic programming paradigm.

His early work with Maarten van Emden provided a direction for the subsequent research on procedural and declarative semantics of programming languages within the specific field of logic programming. In turn, his influential dictum *"Algorithm = Logic + Control"* has shaped our views on the essence of declarative programming within the logic programming framework and has had a large impact on the design of new control mechanisms for this approach to programming. His subsequent research revealed the rich potential of the logic programming paradigm. He showed how legal, metalevel, and commonsense reasoning can naturally be formalized by means of logic programs.

His work with Marek Sergot on the *event calculus* had a long-standing impact on the research effort of representing temporal knowledge and formalizing commonsense reasoning. His research on verification of integrity constraints for database systems became highly relevant in deductive and temporal databases, while his work on abductive reasoning and argumentation was influential for mechanized legal and diagnostic reasoning. More recently, his work on multiagent systems has helped shape new approaches to building intelligent distributed systems.

Several of these themes can be found in the collection of papers that constitute this special issue. All of these papers were solicited directly by the guest editors but, conforming to the high standards of TOCL, went through the usual rigorous refereeing process.

We would like to thank the authors of the contributed papers for their willingness and interest in contributing to this issue. We also thank the referees for their precious time in providing helpful reviews of the submissions.

And to Bob we extend our best wishes and hope he will agree with us that this special issue shows, at least partly, the long-term impact of his research.

The Guest Editors,

KRZYSZTOF R. APT,

ANTONIS C. KAKAS,

FARIBA SADRI