



ARTO SALOMAA

Professor Arto Salomaa has for half a century inspired and guided the foundations of computer science and has been a central figure in modern formal language and automata theory. He is among the most decorated computer scientists in the world, the results of his work are embedded in society's technological infrastructure, and his influence on Western has been fundamental.

Arto Salomaa received his doctorate from the University of Turku in 1960. His studies built on the academic tradition of Finland, being of a fifth generation of dissertations in that country, in an academic genealogy with chains of direct supervision to Leibniz, Huygens, Mersenne, and in 20 generations to Nicolaus Copernicus. Professor Salomaa has supervised 25 doctoral students, giving rise to at least 138 academic descendants in some five further academic generations.

In his work, Professor Salomaa is known for being prolific, deep and broad. Since 1959, he has had more than 500 publications, including 50 books. While this is exceptional by any standard, it is very unusual in theoretical computer science. In terms of area, Professor Salomaa has made major contributions to the theory of formal languages and automata, grammars and rewriting systems, combinatorics on words, cryptography, authentication and secret sharing, models of computation, algorithmic information theory, many-valued logic, Boolean functions and DNA computing.

Among Professor Salomaa's books, a few are especially notable: "Formal Languages," published in 1973, is a brilliant exposition of the mathematical theory of formal languages that has inspired generations of computer scientists. In 1991, this book was credited as being one of 100 most cited texts in mathematics and declared a classic by the Association for Computing Machinery. In three volumes, his "Handbook of Formal Languages" with Grzegorz Rozenberg has become the standard reference for the field. Other books have presented systematic studies of new areas as they have emerged to prominence.

Within the context of Western, Professor Salomaa has had a particularly important influence. In the 1960s he visited our university for two years and was instrumental in the initial establishment of the Department of Computer Science, itself the first in Canada. Our university has benefited from this close relationship continuously to this day: Two of his PhD students were supervised at Western and received their degrees here. Three have been faculty members here, as have two more of his academic descendants. He has for two decades made annual research visits to Western, interacting with several faculty members and students, and most closely with the late Sheng Yu. The strength of Western in theoretical computer science is directly attributable to Professor Salomaa's early influence, as recognized by the "50 Years of Automata Theory," a conference that attracted to Western all of the leading figures in the field.

Finnish sauna has a special role in the world of Professor Salomaa. He says, “When the löyly [an untranslatable term meaning the steam and heat of the sauna, but also “intensity” and, archaically, “spirit”] gets strong, it separates your soul from your body.” Where some characterize problems in computer science by algorithmic complexity, Professor Salomaa will characterize problems by the number of sauna sessions it takes to solve them.

Where Professor Salomaa has perhaps had the greatest influence is through his choice of areas of research and problems. His way of thinking and intuition of which areas will be important and which will bear fruit are most prized by his colleagues. Where Arto Salomaa leads, others will follow and many will invest their scientific careers.

Mr. Chancellor, on behalf of the Vice-Chancellor and in the name of the Senate, I ask you to confer the degree of Doctor of Science, *honoris causa*, upon Arto Salomaa, a giant of theoretical computer science.

Stephen M. Watt
June 13, 2013