

COMPUTER  
SCIENCE

DISTINGUISHED  
LECTURE  
2015

### DATE

27 January 2015  
Tuesday

### TIME

4:00 - 5:30 pm

### VENUE

RRS905  
Sir Run Run Shaw Building  
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### Enquiry

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# The HDL Lola and its Translation to Verilog

## Abstract

Electronic circuits used to be specified by diagrams which more or less represented their physical layout. As circuits became very complex, the limitations of diagrams became apparent. Over time, they were replaced by textual descriptions, giving rise to Hardware Description Languages (HDL). One of the prominent HDLs is Verilog, closely mirroring the appearance of C.

Around 1990 we designed the HDL Lola adopting the same goals as for the PL Oberon: A simple and economical vehicle for teaching.

The effort was encouraged by the advent of FPGAs, re-configurable components. We implemented Lola for the FPGAs of Concurrent Logic and of AlgoTronics, which since then have vanished.

Now we have unearthed and revived Lola and built a compiler. But unlike before, its output is not a configuration file to be loaded onto the chip, but a translation into Verilog. Here we present the gist of Lola-2 and its compiler. Finally we ponder about the differences between HDLs and PLs in general. Are they fundamental? And what are they?



Prof. Niklaus Wirth  
Turing Award Laureate

## Biography

Niklaus Wirth was born in Winterthur, Switzerland, in 1934. He studied electrical engineering at ETH (Federal Institute of Technology) in Zürich, graduated in 1959, received an M.Sc. degree from Laval University in Quebec, and a Ph.D. from the University of California at Berkeley in 1963.

Wirth has been an Assistant Professor of Computer Science at Stanford University (1963-67) and, after his return to Switzerland, a Professor of Informatics at ETH from 1968 – 1999. His principal areas of contribution were programming languages and methodology, software engineering, and design of personal workstations. He has designed the programming languages Algol W (1965), Pascal (1970), Modula-2 (1979), and Oberon (1988), was involved in the methodologies of Structured Programming and Stepwise Refinement, and designed and built the workstations Lilith, with high-resolution display, mouse, and high-level language compiler in 1980, and Ceres in 1986.

He has published several text books for courses on programming, algorithms and data structures, and logical design of digital circuits. He has received many prizes and honorary doctorates, including the Turing Award (1984), the IEEE Computer Pioneer (1988), the Award for outstanding contributions to Computer Science Education (acm 1987), and the IBM Europe Science and Technology Award in 1989. ([www.inf.ethz.ch/personal/wirth](http://www.inf.ethz.ch/personal/wirth))

**The A.M. Turing Award**, sometimes referred as the "Nobel Prize" of Computing, was named in honor of Alan Mathison Turing (1912–1954) who made fundamental advances in computer architecture, algorithms, formalization of computing, and artificial intelligence. It is the annual prestigious technical award, given by the Association for Computing Machinery, for major contributions of lasting importance to computing.

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