OBITUARY

CARL ADAM PETRI
(1926-2010)

Carl Adam Petri, who died on July 2 aged 83 at Siegburg, Germany, is the founder of the influential research and application area of Petri nets, the importance of which is underlined by more than 11000 (known) research papers and books, an annual conference on the topic, and many conferences with special tracks on Petri nets. Carl Adam Petri realised early that his formalism incorporated a wide range of topics from very scientific results in fields like mathematics and physics to industrial applications and tools. We owe this integration of aspects to Carl Adam Petri's conviction that formal models should always be founded in well-understood concepts and laws describing the real world.

In a preface to a recently published book, he noted that the currently used graphical description of Petri nets had been introduced by him at the age of 13 in order to visualise his knowledge of chemical processes, including a plan to analyse catalytic activity. Due to the beginning of the Second World War, he was not able to realise these plans but began to explore them in theory on paper. Already in

1941 he was fascinated by Konrad Zuse's invention of a programmable computer, but he could not start a personal cooperation before the nineteen-seventies.

Starting with these stimuli during his studies of Mathematics at the Technical University of Hannover (1950-56) and the positions as a scientific assistant at the same university and the University of Bonn (1956-62) he became convinced that a theoretical framework is needed to master the fundamental problems arising from the structure and use of computer technology. This framework should be independent of the current technology but in accordance with the laws of physics (e.g. finite and invariant velocity of light, Heisenberg's uncertainty principle). Therefore he rejected the models of central control (automata and Turing machines), being predominant at this time, and developed a model of distributed control. These ideas were published in his doctoral thesis entitled "Kommunikation mit Automaten" (Communicating with automata) in 1962 at the Technical University of Darmstadt. From 1963 to 1991 he held the positions of director of the computer centre of the University of Bonn and the head of the Research Institute for Information Systems at the Society for Mathematics and Information Technology (GMD).

Having the graphical notation of Petri nets in mind, as Carl Adam Petri wrote, interestingly enough it does not appear in the thesis[1], but many of the features of Petri nets are contained in the mathematical notation. Petri nets, as we know them today, appear for the first time in a talk, held by Carl Adam Petri on a conference in 1965 (paper published in 1967). At that time his ideas on concurrency were not so much recognised by the scientific community, probably since they were too advanced compared to the available technology. Nevertheless, they have subsequently been established by the well-known MIT conference of the project MAC in the US and also in Europe. Much research as been done on decidability questions and formal languages. But with the advent of parallel computer systems and distributed networks much of Carl Adams original ideas gained importance. He developed his ideas further in a permanent effort to the end of his life[2]. Carl Adam Petri's concepts include, among many others, concepts and models of concurrent processes, high-level nets, refinement of systems by net topology and continuous mappings, revised order axioms for measurement, a synthesis of discrete and continuous structures and motion, a derivation of computing primitives from smallest closed signal spaces and laws of information conservation. Today Petri nets are appreciated by hardware and software modellers due to their intuitive graphical representation, the availability of powerful tools for development and simulation and the elaborated theory and algorithms for analysis.

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[1]downloadable from:
http://www.informatik.uni-hamburg.de/TGI/mitarbeiter/profs/petri/PetriDis.pdf

[2]See an overview of Carl Adams activities and publications at
http://www.informatik.uni-hamburg.de/TGI/mitarbeiter/profs/petri.html

Carl Adam Petri received a number of awards, among them the Computer Pioneer Award of the IEEE in 2008, honouring him on their web site with the words: "For establishing Petri net theory in 1962, which not only was cited by hundreds of thousands of scientific publications but also significantly advanced the fields of parallel and distributed computing." In 1988 he became an Honorary Professor at the University of Hamburg. In regularly held seminars he conveyed his ideas on concurrency to scientists and students. These seminars often lasted far into the night. In particular at these events we were able to experience his modesty and patience, his interest for all contributions and suggestions, and his always friendly and extremely detailed responses to questions. The community will miss him.

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