

FRIDAY – June 28, 2019

Retrospective and Perspective of Petri Net Research



*How it all began*



Wolfgang Reisig



- a personal recollection -

Prof. Dr. W. Reisig

# *The rise of the Petri Net Conference Series*

*... based on*

*the bio of Carl Adam Petri*

*and on the history of GMD / ISF*

# *Carl Adam Petri*

*Born 1926 in Leipzig*

*School*

*Military*

*Prisoner of war*

*Student of mathematics in Hanover*

*Diplom 1956 with Heinz Unger*

*PhD student with Heinz Unger*

*at Univ. of Bonn*



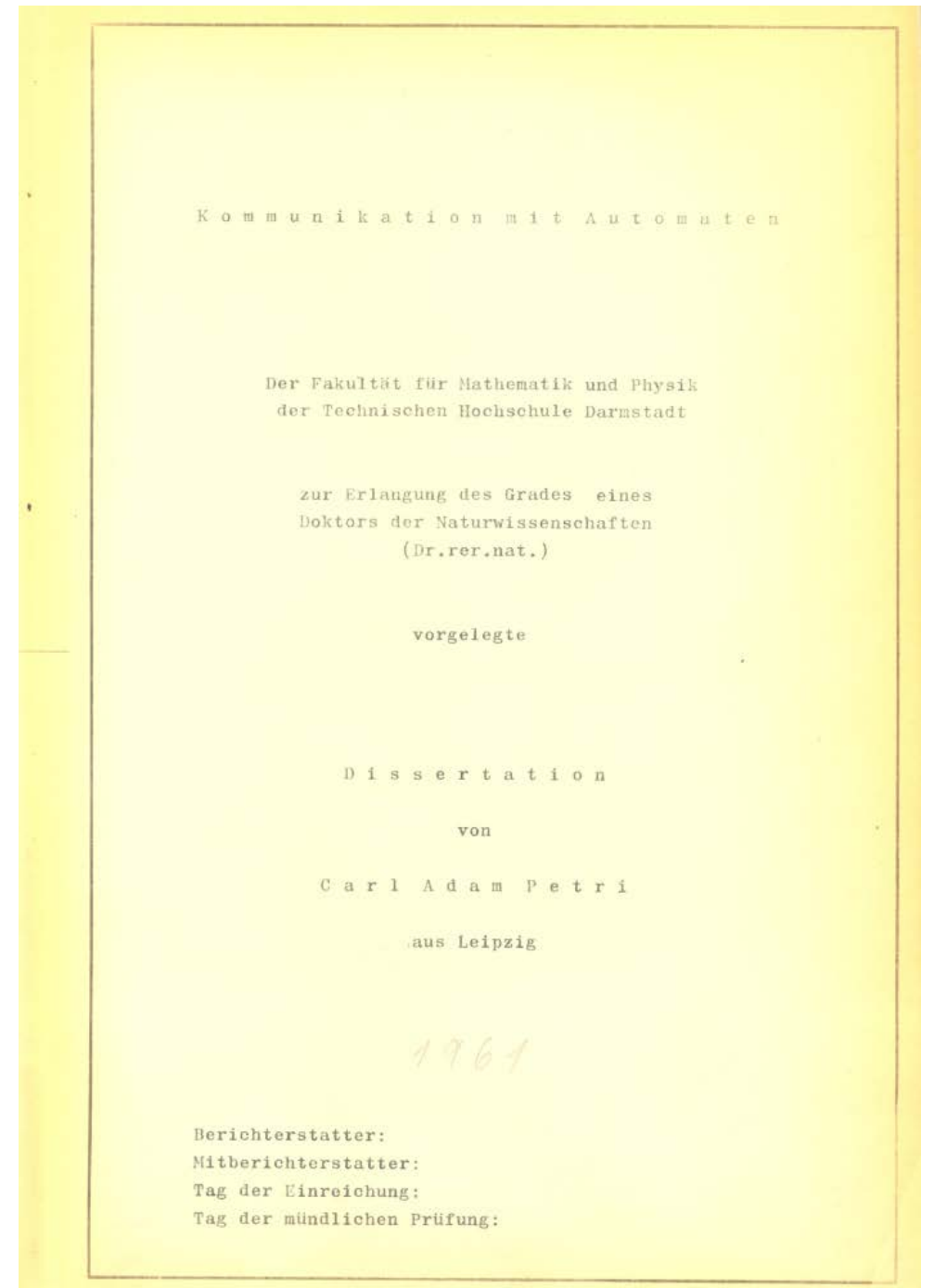
# *A somewhat unusual PhD thesis*

*Communication with Automata*

to Alwin Walter at  
Darmstadt University ...

decorated as the best PhD  
in 1962.

not a conventional thesis;  
... more a research program



# One of the central ideas:

Assume a computation  
using up  
all available store  
and needing more ...

How proceed?

Extend the computer!

Is this *always* possible?

Only if the computer  
operates *asynchronously*.

Asynchronous communication  
can do more  
than centralized,  
sequential computation.

... a strange idea in 1961!

Applications used  
*one* computer.

Theory focused on  
computability, complexity.

# *Postdoc*

*Managing a computer  
of the Maths department in Bonn  
until 1968.*

# 1968: Foundation of GMD

National research center for  
*Mathematics and  
Data processing*



# 1968: Foundation of GMD

Petri appointed head of the  
*Institute for  
Information Systems Research*

With 6 (?) PhD- and Postdoc  
positions

*Hartmann Genrich, Kurt Lautenbach,  
Klaus Voss, ...*





# *1968 – 1979 a hostile environment*

1968: declaring the software crisis,  
trying to overcome it by  
better programming languages  
- instead of modeling languages  
*Dijkstra, Bauer, Hoare, Wirth ...*

Theoretical Informatics: computability,  
complexity, automata and logic, ...

Concurrency was not considered relevant

Nevertheless:

activities in

Paris *Claude Girault*

Milano *degli Antoni*

Helsinki *Leo Ojala*

Warsaw *Antoni Mazurkiewicz*

Hamburg *Wilfried Brauer*

Newcastle *Peter Lauer*

US / MIT *Anatol Holt, Jack Denis*

*Michael Hack, Commoner, Thiagu*

# 1979: Hamburg Advanced Course

A two weeks summer school

Organized by Prof. Wilfried Brauer

With more than 100 attendees

*with speakers*

*including*

Carl Adam Petri

Eike Bestl

Hartmann J. Genrich

Claude Girault

Matthias Jantzen

Kurt Lautenbach

Jerry D. Noe

Horst Oberquelle

Suhas S. Patil G

G rard Roucairol

Robert M. Shapiro

Joseph Sifakis,

P.S. Thiagarajan

R diger Valk

Konrad Zuse



# 1979: Hamburg Advanced Course

*The first comprehensive presentation  
of results on Petri nets*

LNCS 84

*... the starting point of  
the Petri net community*

*Starting special interest groups on Petri net  
In Germany and in France*

*Agreement for a 1980 workshop in Strasbourg*



# 1980: the Strasbourg workshop

*Organized by Claude Girault*

Participants from groups in  
*Aarhus, Bonn, Hamburg, Helsinki,  
Leiden, Milano, Newcastle, Paris,  
Zaragoza(?) ...*  
*Single scientists from many places*



# Establishing the steering committee

*A memorable dinner*

*Participants: whoever was interested*

*Undisputed boss: Grzegorz Rozenberg*

*... an annual workshop?*

*... an annual conference?*

*Periodic advanced courses?*

*A journal?*

*A newsletter?*

*A steering committee?*



# The regular meetings

## The conferences:

1980 Strasbourg, France  
1981 Bad Honnef, Germany  
1982 Varenna, Italy  
1983 Toulouse, France  
1984 Aarhus, Denmark  
1985 Espoo, Finland  
1986 Oxford, UK  
1987 Zaragoza, Spain  
1988 Venice, Italy  
...  
2019 Aachen

## Advanced Courses:

1979 Hamburg  
1986 Bad Honnef  
1996 Dagstuhl  
2003 Eichstädt  
2010 Rostock

More on this  
by Maciej

# The 1980ies: general acceptance

Robin Milner  
in his Turing Award Lecture:

*Much of what I have been saying  
was already well understood  
in the sixties by Carl Adam Petri,  
who pioneered the scientific  
modeling of discrete concurrent  
systems.*

*Petri's work has a secure place  
at the root of concurrency theory.*



# Credits



1988 Verdienstkreuz 1. Klasse des Verdienstordens der Bundesrepublik Deutschland,  
1988 Honorary professor at Hamburg University,  
1989 Member of Academia Europaea, London,  
1993 Konrad-Zuse-Medaille der Gesellschaft für Informatik, for distinguished credit  
for informatics,  
1997 Werner-von-Siemens-Ring, for outstanding merits for techniques in connection  
with science,  
1997 Member of the New York Academy of Sciences,  
1999 Honorary doctorate of the University of Zaragoza,  
2003 Commandeur in de Orde van de Nederlandse Leeuw.



# ... Some more pictures



# The 2000ies

playing the  
token game



# The “official” picture



# Further reading

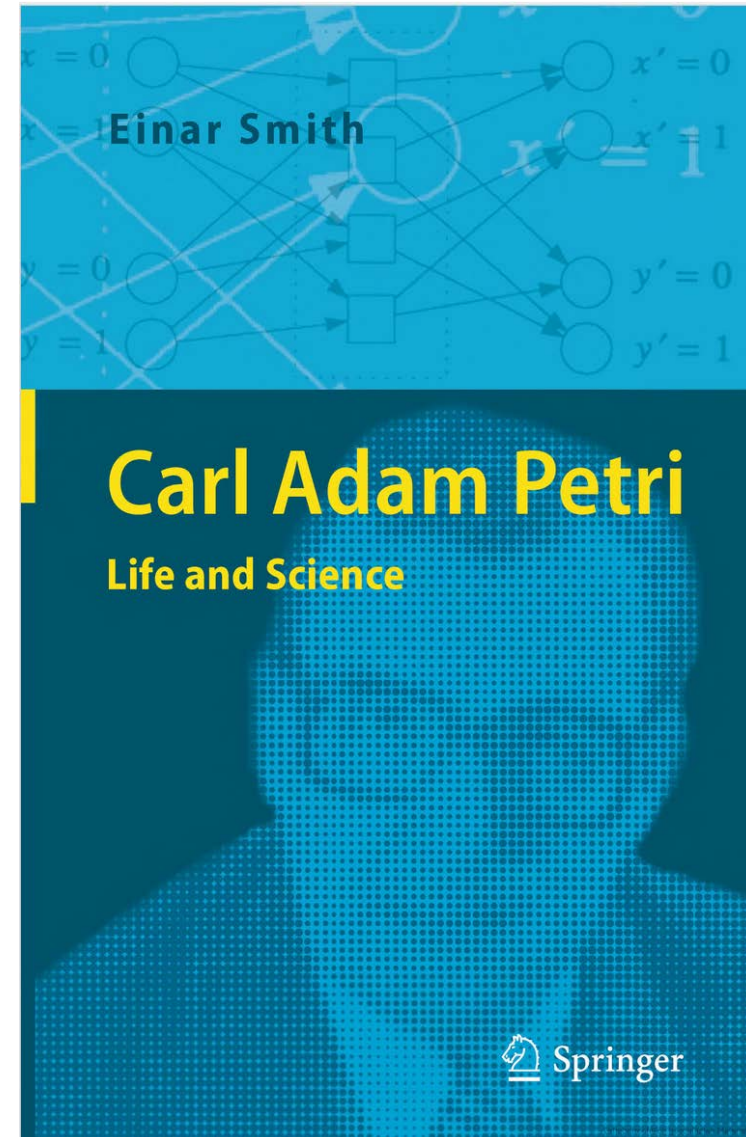
*Petri's scientific inheritance at  
The archive of  
Deutsches Museum Munich*



# Further reading

*Beautiful biography  
with many anecdotes*

*By Einar Smith*



# Further reading

Just published:

individual perspectives

personal memories

current Petri net research

applications

Balbo, Gianfranco & Ciardo, Gianfranco  
Bernardinello, Luca & Pomello, Lucia  
Bruni, Roberto & Montanari, Ugo  
Chini, Peter & Meyer, Rolan.  
Cortadella, Jordi  
de Frutos Escrig, David  
de Michelis, Giorgio  
Desel, Jörg  
Diaz, Michel  
Esparza, Javier  
Fahland, Dirk  
Gorrieri, Roberto  
He, Xudong  
Heiner, Monika  
Janicki, Ryszard  
Jensen, Kurt & Nielsen, Mogens  
Kindler, Ekkart  
Koch, Ina  
Koutny, Maciej  
Memmi, Gerard  
Penczek, Wojciech  
Randell, Brian  
Schmidt, Heinz  
Silva, Manuel  
Smith, Einar  
Valk, Rüdiger  
van der Aalst, Wi  
van Hee, Kees  
Yakovlev, Alex



Wolfgang Reisig  
Grzegorz Rozenberg *Eds.*

## Carl Adam Petri: Ideas, Personality, Impact

 Springer

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