

CS3012: Software engineering

Professor Stephen Barret

Biography of a software engineer: David Lorge Parnas

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David Lorge Parnas is an early pioneer of software engineering who came up with and developed the concept of information hiding in modular programming and is also noted for his advocacy of precise documentation.

Dr. David Lorge Parnas was born on the 10th of February 1941, in Plattsburgh, New York, USA. He is particularly known for his work on the concept of information hiding in modular programming, which plays an important role in object-oriented programming in this day and age.. He earned his engineering license in Canada and was an early applicator of engineering practices and principles to software development.. He is licensed as a Professional Engineer in Ontario and has been writing and publishing papers since 1969, with many of his works standing the test of time.

Dr. David Lorge Parnas is highly regarded for his many valuable contributions to software engineering. He developed and applied cutting-edge software technology to the U.S. Navy's A-7E aircraft, and he advised the Atomic Energy Control Board of Canada on the use of safety-critical, real-time software. During his career, he has contributed more than 200 papers to ACM, IEEE, and ICSE publications. He won an ACM "Best Paper" award, two "Most Influential Paper" awards from ICSE, and the 1998 "Outstanding Researcher" award from ACM SIGSOFT. In May 2001, Dr. Parnas was recognized at the International Conference on Software Engineering for his lifetime of outstanding achievements



Education

Dr. David Lorge Parnas earned his Ph.D at Carnegie Mellon University in electrical engineering. He continued to further his education throughout his career, and has received certification from many educational institutions. They are:

- 1961 B.S. in Electrical Engineering (with honours), Carnegie Institute of Technology, Pittsburgh, Pa.
- 1964 Electrical Engineering Ph.D.
- Ph.D. 1965 Electrical Engineering - Systems & Communications Sciences
- 1986: "Doktor der technischen Wissenschaften -ehrenhalber"), granted by the Federal Institute of Technology (ETH) in Zurich Switzerland
- 1996: Doctorate Honoris Causa, granted by Catholic University of Louvain (Belgium)
- University of Italian Switzerland (Lugano)-----f-f-f-f-

Dr. Parnas has also held many teaching or research positions throughout his career. He has held positions in ;

- Carnegie-Mellon University, USA (professor)
- The University of Maryland, USA
- The Technische Hochschule Darmstadt, Germany (professor)
- The University of North Carolina at Chapel Hill, USA (professor)
- The Naval Research Laboratory, USA
- The University of Victoria, Canada
- Queen's University in Kingston, Ontario
- McMaster University, Canada (Professor Emeritus)
- University of Limerick, Ireland (Professor of Software Engineering at the University of Limerick until his retirement in 2008, and where he is now Emeritus Professor of Software Engineering)

Dr. Parnas is a Fellow of the Royal Society of Canada (RSC), the Association for Computing Machinery (ACM), the Canadian Academy of Engineering (CAE), the Gesellschaft für Informatik (GI) in Germany and the IEEE. He is a Member of the Royal Irish Academy.

Published papers

David L. Parnas is considered to be one of the grandmasters of software engineering. His academic research and industrial collaborations have exerted far-reaching influence on software design and development. His writings constitute the foundation for modern software theory and practice.

Dr. Parnas has authored over 265 academic papers and reports. His papers have been published repeatedly and many are considered classics. You can find a collection of his papers in the following book ***Software Fundamentals: Collected Papers by David L. Parnas*** (Hoffman, D.M., Weiss, D.M. (eds.), "Software Fundamentals: Collected Papers by David L. Parnas", Addison-Wesley, 2001, 664 pgs., ISBN 0-201-70369-6.)

Awards and honors

Dr. Parnas was the first winner of the Norbert Wiener Prize from Computing Professionals for Social Responsibility. He has also received the Fiff prize from Forum Informatiker für Frieden und Verantwortung in Germany. He won an ACM "Best Paper" Award in 1979, two "Most Influential Paper" awards from the International Conference on Software Engineering, the 1998 ACM SIGSOFT "Outstanding Research Award", the IEEE CS's "Practical Visionary Award" given in honor of the late Dr. Harlan Mills, and the "Component and Object Technology" Award presented at TOOLS99.

IEEE-CS 60th Anniversary Award

Parnas was proud to share the IEEE Computer Society's sixtieth anniversary award with Professor Maurice Wilkes of Cambridge University, "For insights into making large-scale systems development manageable with the concepts of encapsulation and information hiding, and helping to establish software development as an engineering discipline firmly rooted in mathematics."

1999 Harlan Mills Award Recipient

“For fundamental contributions to large-scale systems development by establishing software engineering as an engineering discipline.”

Work

- Information hiding:
 - Dr. Parnas developed the concept of information hiding in modular programming. Information hiding is the principle of segregation of the *design decisions* in a computer program that are most likely to change, thus protecting other parts of the program from extensive modification if the design decision is changed. This is an important element in object-oriented programming today.
 - *“On the Criteria to be Used in Decomposing Systems into Modules”*
David L. Parnas,
- Strategic Defense Initiative Activism:
 - Dr Parnas took a public stand against the US Strategic Defense Initiative (also known as "Star Wars") in the mid 1980s, arguing that it would be impossible to write an application of sufficient quality that it could be trusted to prevent a nuclear attack. He has also been in the forefront of those urging the professionalization of "software engineering" . Dr. Parnas is also a heavy promoter of ethics in the field of software engineering.
 - *“Software aspects of strategic defense systems”*, David L. Parnas
 - *“On 28 June 1985, David Large Parnas, a respected computer scientist who has consulted extensively on United States defense projects, resigned from the Panel on Computing in Support of Battle Management, convened by the Strategic Defense Initiative Organization (SDIO). With his letter of resignation, he submitted eight short essays explaining why he believed the software required by the Strategic Defense Initiative would not be trustworthy.”*

References:

- <https://web.archive.org/web/20060712073649/http://www.sqrl.ul.ie/profiles/David.pdf>
- <https://www.computer.org/profiles/david-parnas>
- <https://alchetron.com/David-Parnas>
- [https://books.google.ie/books?id=ia9vQgAACAAJ&dq=Hoffman,+D.M.,+Weiss,+D.M.+\(eds.\),+%E2%80%9CSoftware+Fundamentals:+Collected+Papers+by+David+L.+Parnas%E2%80%9D,+Addison-Wesley,+2001,+664+pgs.,+ISBN+0-201-70369-6.&hl=en&sa=X&ved=0ahUKEwibgsqSql_IAhW3VhUIHd3GBP8Q6AEIRTAf](https://books.google.ie/books?id=ia9vQgAACAAJ&dq=Hoffman,+D.M.,+Weiss,+D.M.+(eds.),+%E2%80%9CSoftware+Fundamentals:+Collected+Papers+by+David+L.+Parnas%E2%80%9D,+Addison-Wesley,+2001,+664+pgs.,+ISBN+0-201-70369-6.&hl=en&sa=X&ved=0ahUKEwibgsqSql_IAhW3VhUIHd3GBP8Q6AEIRTAf)
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