

IOWA STATE UNIVERSITY

Department of Computer Science

2009-10 Robert Stewart Distinguished Lecture



Dr. David Parnas

Precise Documentation: The Key to Better Software

Thursday March 25, 2010
3:40pm, Howe Hall
Alliant Energy Lee Liu Auditorium

Much time is lost by software development organizations because they do not produce and maintain precise and complete design documentation. Failure to document designs properly reduces the efficiency of every phase in development and contributes to the low quality software that we see so often today. Strangely, Computer Scientists do little research on this topic. In fact, this is one area where CS theory (mathematics) can really help but researchers need to understand both mathematics and the problems experienced during software development. Software Engineering is the only engineering discipline where well educated Engineers have not learned how to take advantage of mathematics in their daily work.

This talk explains how good documents can be used during design, review, implementation, inspection, and testing. It also shows how mathematical expressions in tabular form can make documents easy to produce and use without sacrificing precision. When completing and reviewing these documents to make sure that each document is precise, accurate, complete and consistent with other documents, developers perform the analyses necessary to assure that the product will be of high quality. Among the beneficial effects of good documentation are easier reuse of old designs, better communication about requirements, easier integration of separately written modules, more effective inspection and more effective testing. The role of documents in each of these activities will be illustrated and explained.

Dr. David Lorge Parnas has been studying industrial software development and publishing widely cited papers since 1969. Many of his papers have been found to have lasting value. For example, a paper written 25 years ago, based on a study of avionics software, was recently awarded a SIGSOFT IMPACT award. In all, he has won more than 20 awards for his contributions. In 2007, Parnas was proud to share the IEEE Computer Society's onetime sixtieth anniversary award with computer pioneer Professor Maurice Wilkes of Cambridge University.

Dave received his B.S., M.S. and Ph.D. in Electrical Engineering from Carnegie Mellon University. and honorary doctorates from the ETH in Zurich (Switzerland), the Catholic University of Louvain (Belgium), and the University of Italian Switzerland (Lugano). He is licensed as a Professional Engineer in Ontario. 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. Parnas is the author of more than 265 papers and reports. Many of his papers have been repeatedly republished and are considered classics. A collection of his papers can be found in: 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,.

Dr. Parnas is Professor Emeritus at McMaster University in Hamilton Canada, and at the University of Limerick Ireland. He is an Honorary Professor at Jilin University in China.