



**BCS**

**The 9<sup>th</sup> Annual  
Turing Lecture**



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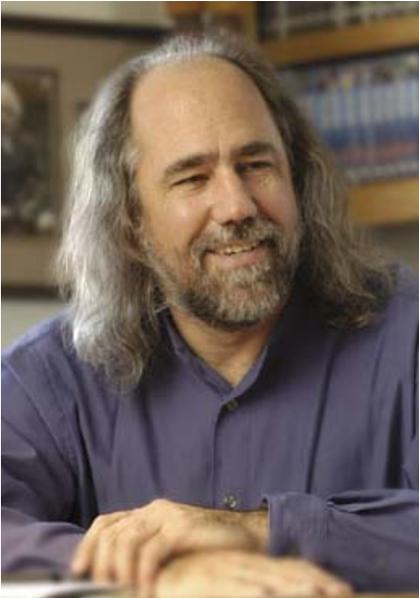


**The Promise, the Limits and the Beauty  
of Software**

**Grady Booch, IBM**

# The Promise, the Limits and the Beauty of Software

## SYNOPSIS



Within this generation, software has changed the way that individuals collaborate, organizations do business, economies operate, and cultures interact.

Software-intensive systems can amplify human intelligence, but they cannot replace human judgement; software-intensive systems can fuse, coordinate, classify, and analyze information, but they cannot create knowledge.

Although software offers seemingly limitless promise, there are some very real limits to what software can do. Not everything we want to build can be built: there exist pragmatic theoretical and technical limits that make software development hard, if not in some cases impossible.

Furthermore, not everything we want to build should be built: there exist moral, economic, social, and political limits that govern human industry.

Software-intensive systems are perhaps the most intellectually complex artefacts created by humans, and while the majority of individuals in the civilized world rely on software in their daily lives, few of them understand the essential complexity therein, the labour required to create such artifacts, and the beautiful and elegant chaos of their architecture.

Tonight's presentation will examine the promise, the limits, and the beauty of software, as well as offer some conclusions that can be drawn from the last 60 years of software and some expectations and cautions for the next generation.

*We are pleased to announce that tonight's proceedings are being broadcast live on [IET.tv](http://www.iet.tv) and the video will be available to view from tomorrow on [www.iet.tv](http://www.iet.tv)*

## **BIOGRAPHY**

### **Grady Booch, IBM**

Grady Booch is recognized internationally for his innovative work on software architecture, software engineering, and modelling.

A renowned visionary, he has devoted his life's work to improving the effectiveness of software developers worldwide. Grady served as Chief Scientist of Rational Software Corporation since its founding in 1981 and continues to serve in that capacity within IBM.

Grady is one of the original authors of the Unified Modelling Language (UML) and was also one of the original developers of several of Rational's products. Grady has served as architect and architectural mentor for numerous complex software-intensive projects around the world in just about every domain imaginable.

Grady is the author of six best-selling books, including the UML Users Guide and the seminal Object-Oriented Analysis with Applications, and has published several hundred articles on software engineering, including papers published in the early '80s that originated the term and practice of object-oriented design.

Grady is a member of the Association for Computing Machinery (ACM), the Institute of Electrical and Electronic Engineers, the American Association for the Advancement of Science (AAAS), and Computer Professionals for Social Responsibility (CPSR).

He is an IBM Fellow, an ACM Fellow, a World Technology Network Fellow, and a Software Development Forum Visionary. Grady was a founding board member of the Agile Alliance, the Hillside Group, and the Worldwide Institute of Software Architects, and now also serves on the board of the International Association of Software Architecture. He also serves on the boards of Newmont University and the Iliff School of Theology.

Grady received his bachelor of science from the United States Air Force Academy in 1977 and his master of science in electrical engineering from the University of California at Santa Barbara in 1979.

Grady lives in Colorado. His interests include reading, travelling, singing, and playing the harp.

## THE TURING LECTURE BACKGROUND

The all-pervasive nature of the general-purpose computer has made the most profound mark on almost every aspect of our lives. The central seminal figure in this computer revolution was Alan Turing, whose outstanding originality and vision made it possible, in work originating in the mid 1930s. Although it is now hard to see what the limits of the computer revolution might eventually be, it was Turing himself who pointed out to us the very existence of such theoretical limitations.

In honour and recognition of Turing's contribution in the field of computing, the IET and BCS established the Turing Lecture with the first lecture being presented in 1999. It is intended to be a leading event, presenting a topic from current research in computer science given by an acknowledged expert in the field. The content of the lecture is published in the BCS's Computer Journal. The lecture in general is intended to attract significant audiences from the academic and industrial research/development sectors. As such, the lecture should be accessible to a somewhat wider audience than those involved in the specific field of academic research. The IET and BCS jointly handle the promotion and administration of the lecture.

Grady Booch's lecture represents the 9th lecture in the series.

### ***The Past Turing Lectures:***

1999 Professor Samson Abramsky - *"From Computation to Interaction – Towards a Science of Information"*

2000 Professor Brian Randell - *"Facing up to Faults"*

2001 Nick Donofrio - *"Technology Innovation and the New Economy"*

2002 Professor Mark E Welland - *"Smaller, Faster, Better – but is it Nanotechnology"*

2003 Dr Carol Kovac - *"Computing in the Age of the Genome"*

2004 Professor Fred Piper - *"Cyberworld Security – the Good the Bad and the Ugly"*

2005 Professor Frederick P Brooks – *"Collaboration and Telecollaboration in Design"*

2006 Chris Mairs – *"Lifestyle Access for the Disabled – Adding Positive Drift to the Random Walk with Technology"*