

Lecture Notes in Computer Science

Edited by G. Goos and J. Hartmanis

327

Gary A. Ford (Ed.)



Software Engineering Education

SEI Conference 1988

Fairfax, Virginia, USA, April 28–29, 1988

Proceedings



Springer-Verlag

New York Berlin Heidelberg London Paris Tokyo

Editorial Board

D. Barstow W. Brauer P. Brinch Hansen D. Gries D. Luckham
C. Moler A. Pnueli G. Seegmüller J. Stoer N. Wirth

Editor

Gary A. Ford
Software Engineering Institute, Carnegie Mellon University
Pittsburgh, PA 15213, USA



Carnegie-Mellon University
Software Engineering Institute

CR Subject Classification (1987): D.2, K.3.2

ISBN 0-387-96854-7 Springer-Verlag New York Berlin Heidelberg
ISBN 3-540-96854-7 Springer-Verlag Berlin Heidelberg New York

This work is subject to copyright. All rights are reserved, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, re-use of illustrations, recitation, broadcasting, reproduction on microfilms or in other ways, and storage in data banks. Duplication of this publication or parts thereof is only permitted under the provisions of the German Copyright Law of September 9, 1965, in its version of June 24, 1985, and a copyright fee must always be paid. Violations fall under the prosecution act of the German Copyright Law.

© Springer-Verlag Berlin Heidelberg 1988
Printed in Germany

Printing and binding: Druckhaus Beltz, Hemsbach/Bergstr.
2848/3140-543210

Preface

The Software Engineering Institute (SEI) is a federally funded research and development center operated by Carnegie-Mellon University. Its principal responsibility is to accelerate the reduction to practice of modern software engineering techniques and methods. Included in this responsibility are the identification, assessment, development, dissemination, and insertion of promising methods, techniques, and tools to support software engineering.

Recognizing that education is the foundation for substantial improvements in developing and using technology, the SEI charter also includes the sentence, "[The SEI] shall also influence software engineering curricula development throughout the education community." Our experiences to date indicate that the education community is very interested in software engineering education, and that the SEI can play an important role in focusing activities in the development of courses and curricula, in catalyzing the production of textbooks, educational software, and other course support materials, and in providing for widespread distribution of information and materials.

An annual activity of the SEI is the *SEI Conference on Software Engineering Education*. The purpose of the conference is to promote enhanced software engineering education in the academic, industrial, and government educational communities, and to promote interactions among educators in these three communities. The conference includes refereed papers, panel discussions, reports and demonstrations from the SEI; future conferences will also include exhibits and demonstrations of educational materials and software tools.

The Program Committee for the 1988 conference was:

Jon Bentley, *AT&T Bell Labs*
James Collofello, *Arizona State University*
H. E. Dunsmore, *Purdue University*
Richard Fairley, *George Mason University*
Jeffrey A. Lasky, *Rochester Institute of Technology*
H. Dieter Rombach, *University of Maryland*
Gail Sailer, *Boeing Computer Services*
James E. Tomayko, *The Wichita State University*

and, from the SEI:

Mark Ardis
Lionel Deimel
Charles Engle
Gary Ford
Norman Gibbs
Robert Glass
Harvey Hallman
Scott Stevens

Gary Ford

Pittsburgh, Pennsylvania
April, 1988

Contents

Keynote Address: Teaching the Tricks of the Trade	1
<i>Jon Bentley, AT&T Bell Labs</i>	
Strategic Imperatives in Software Engineering Education	9
<i>Harlan Mills, University of Florida and Information Systems Institute</i>	
Software Engineering in the Johns Hopkins University Continuing Professional Programs	20
<i>Vincent G. Sigillito, Bruce I. Blum, and P. H. Loy, Johns Hopkins University</i>	
Meeting the Training Needs of Practicing Software Engineers at Texas Instruments	32
<i>Freeman L. Moore and Phillip R. Purvis, Texas Instruments</i>	
An Industrial Course in Software Quality Assurance	45
<i>R. B. Hunter, University of Strathclyde</i>	
SEI Report: The Design of an MSE Curriculum	55
<i>Mark A. Ardis, SEI</i>	
The Software Engineering Graduate Program at the Boston University College of Engineering	56
<i>John Brackett, Thomas Kincaid, and Richard Vidale, Boston University</i>	
The Software Engineering Programs at George Mason University	64
<i>Richard E. Fairley, George Mason University</i>	
Revised Graduate Software Engineering Curriculum at Monmouth College	70
<i>Serafino Amoroso, Richard Kuntz, Thomas Wheeler, and Bud Graff, Monmouth College</i>	
Embedded Computer Systems; Requirements Analysis & Specification—An Industrial Course	81
<i>Jonah Z. Lavi (Loeb) and Michael Winokur, Israel Aircraft Industries</i>	
A Course on Software Engineering for Concurrent Systems	106
<i>K.-C. Tai, North Carolina State University</i>	
SEI Demonstration: Advanced Learning Technologies Project	120
<i>Scott Stevens, SEI</i>	
Undergraduate Software Engineering Education	121
<i>William E. Richardson, Air Force Academy</i>	
Reducing Student Workload in a Software Engineering Project Course	145
<i>David Alex Lamb, Queen's University</i>	
An Undergraduate Course in Software Design	154
<i>Daniel Hoffman, University of Victoria</i>	
Software Tools at the University: Why, What and How	169
<i>Laurie Honour Werth, University of Texas at Austin</i>	
A Scarce Resource in Undergraduate Software Engineering Courses: User Interface Design Materials .	187
<i>Laura Marie Leventhal and Barbee T. Mynatt, Bowling Green State University</i>	
Ada Edu Project: Supporting the Use of Ada in Introductory Computer Science	199
<i>Ravinder Chandhok and Terry A. Gill, Carnegie Mellon University</i>	