

# Engineering of Computer Based-Systems Enhancement Courses - Proposed Course Outlines

Jonah Z. Lavi  
CBSE Associates, Israel  
lavijona@shani.net

Regina M. Gonzales  
New Mexico State University, USA  
regonzal@NMSU.edu

Mike Mannion  
Napier University, Scotland  
m.mannion@napier.ac.uk

Miroslav Sveda  
Technical University of Brno, Czech Republic  
sveda@cese.fee.vutbr.cz

## Abstract

*Many modern systems are controlled by Computer-Based Systems (CBS). Examples include commercial management information systems such as airline reservations, payroll information, stock control, and electronic banking systems, real-time embedded computer systems such as process control and computer integrated manufacturing systems, space systems, telephone and communications systems, transportation systems (automotive control, train control, ship control, traffic control), medical instruments, avionics systems, missile control systems, microcomputer controlled domestic appliances and point of sale systems.*

*The CBS controlling these systems, typically consist of many networked, geographically distributed subsystems. Each subsystem may be or may contain a multi-computer system. They are intensively dependent on software, and frequently depend on data communication networks, human-computer interaction, and special hardware.*

*Engineers developing such systems have to work with CBS engineers responsible for the development of the supporting CBS. To be able to work with them they have to have a basic knowledge in the Engineering of CBS (ECBS).*

*The paper describes the ECBS tasks to be undertaken by systems engineers during the development of systems they build, the CBS subjects they should understand and comprehend and the structure of the courses they should take to augment their knowledge.*

*The proposed courses can be given as part of regular engineering undergraduate or graduate programs, or as training courses in industry.*

*The proposed ECBS courses are being developed by the Education and Training Working Group of the IEEE Computer Society ECBS Technical Committee. The current version of the suggested courses is based on the results of the discussions of the working group during the ECBS98 conference in Jerusalem, and on work done during the past year by the group following ECBS98.*

## 1. Background

Many modern systems are controlled by Computer-Based Systems (CBS). Examples include commercial management information systems such as airline reservations, payroll information, electronic banking systems; real-time embedded computer systems such as process control and computer integrated manufacturing systems, space systems, telephone and communications systems, transportation systems (automotive control, train control, ship control, traffic control), medical instruments, avionics systems, missile control systems, microcomputer controlled domestic appliances and point of sale systems.

The CBS controlling these systems, typically consist of many networked, geographically distributed subsystems. Each subsystem may be or may contain a multi-computer system. They are intensively dependent on software, frequently depend on data communication networks, on human-computer interaction, and special hardware. Sometimes they are tightly integrated with their environments. The CBS may be internal to the developed systems, for example in a medical instrument,

# Engineering Of Computer Based Systems Proceedings

**Jerzy Rozenblit, Tony Ewing, Stephan  
Schulz**



## **Engineering Of Computer Based Systems Proceedings:**

Proceedings IEEE Conference and Workshop on Engineering of Computer-Based Systems IEEE Computer Society Technical Committee on the Engineering of Computer Based Systems,1999 Engineering of Computer-Based Systems Jan Kofroň,Tiziana Margaria,Cristina Seceleanu,2023-11-28 This book constitutes the refereed proceedings of the 8th International Conference on Engineering of Computer Based Systems ECBS 2023 which was held in Västerås Sweden in October 2023 The 11 full papers included in this book were carefully reviewed and selected from 26 submissions and present software hardware and communication perspectives of systems engineering through its many facets The special theme of this year is Engineering for Responsible AI **Fifth European Conference on the Engineering of Computer Based Systems** George Angelos Papadopoulos,2017-08-31 Fifth European Conference on the Engineering of Computer Based Systems Aug 31 2017 Sep 01 2017 Larnaca Cyprus You can view more information about this proceeding and all of ACM's other published conference proceedings from the ACM Digital Library <http://www.acm.org/dl> **Proceedings** ,1994 *Engineering of Computer-based Systems* IEEE Computer Society. Technical Committee on the Engineering of Computer Based Systems,2002 Papers from an April 2002 conference 25 in all report on academic achievements and industrial applications in the engineering of computer based systems Contributors represent some 12 countries and a variety of application domains Papers deal with themes of requirements engineering processes and tools system properties and methods modeling and analysis system architecture model based system development component based design and reuse embedded systems and mobile agents Specific topics include an intelligent agent security intrusion system managing complex temporal requirements in real time control systems using category theory to model software component dependencies and advanced Petri nets for modeling mobile agent enabled interorganizational workflows There is no subject index Annotation copyrighted by Book News Inc Portland OR **1994 Tutorial and Workshop on Systems Engineering of Computer-Based Systems** Harold W. Lawson,1994 ECBS 2005 Jerzy Rozenblit,Tim O'Neill,Jianfeng Peng,2005-01-01 This annual conference continues to explore advance methods and techniques for the design development and deployment of complex systems whose behavior is largely determined and controlled by computers ECBS 2005 encompasses many facets system modeling formal methods requirements specification and engineering architectures system integration project management and life cycle issues This emerging discipline provides innovative techniques for tackling complexity which is inherent in integrating software hardware and communication components into a complete system **ECBS 2007** John Keaney,Jerzy Rozenblit,Jianfeng Peng,2007-01-01 *Engineering of Computer-based Systems* Jerzy Rozenblit,Tim O'Neill,Jianfeng Peng,2007 **International Conference and Workshop on Engineering of Computer-Based Systems** Jerzy Rozenblit,Tony Ewing,Stephan Schulz,1997 ECBS'99 ,1999 The proceedings comprise the tutorial sessions technical sessions position papers for panel sessions and working group meetings of the March 7 12 1999 IEEE Institute of

Electrical and Electronics Engineers conference Technical sessions undoubtedly captivating participants addressed software a **Advances in Computers** ,1994-09-29 Advances in Computers *Bayesian Network* Ahmed Rebai,2010-08-18

Bayesian networks are a very general and powerful tool that can be used for a large number of problems involving uncertainty reasoning learning planning and perception They provide a language that supports efficient algorithms for the automatic construction of expert systems in several different contexts The range of applications of Bayesian networks currently extends over almost all fields including engineering biology and medicine information and communication technologies and finance This book is a collection of original contributions to the methodology and applications of Bayesian networks It contains recent developments in the field and illustrates on a sample of applications the power of Bayesian networks in dealing the modeling of complex systems Readers that are not familiar with this tool but have some technical background will find in this book all necessary theoretical and practical information on how to use and implement Bayesian networks in their own work There is no doubt that this book constitutes a valuable resource for engineers researchers students and all those who are interested in discovering and experiencing the potential of this major tool of the century

**Engineering of Computer-based Systems** ,2002 *Engineering of Computer-Based Systems (ECBS 2002): Proceedings of the IEEE Conference and Workshop on Engineering of Computer-Based Systems (9th: 2002: Lund, Sweden* ,2002 [Proceedings, International Conference and Workshop on Engineering of Computer-Based Systems](#) Tony

Ewing,Jerzy Rozenblit,Stephan Schulz,1997 **Engineering of Computer-Based Systems** Jan Kofroň,Tiziana Margaria,Cristina Seceleanu,2024 This book constitutes the refereed proceedings of the 8th International Conference on Engineering of Computer Based Systems ECBS 2023 which was held in V ster s Sweden in October 2023 The 11 full papers included in this book were carefully reviewed and selected from 26 submissions and present software hardware and communication perspectives of systems engineering through its many facets The special theme of this year is Engineering for Responsible AI

*Engineering of Computer-based Systems* ,2001 This proceedings of an April 2001 conference in Washington DC comprises almost 50 papers on topics including modeling tools and technology testing and Web based systems architecture quality and measurement and analysis and experimentation The goal of the conference was to advance methods techniques and tools for the engineering of computer based systems This emerging discipline is devoted to the design development deployment and analysis of complex systems whose behavior is largely determined by computers The volume is indexed by author but not by subject c Book News Inc **Engineering of Computer-based Systems (ECBS)**

David W. Bustard,Roy Sterritt,2008 **Proceedings** ,2001

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