Preface

This book presents recent developments and discoveries in the vital areas of software engineering to stimulate further research, and to rapidly pass such discoveries to our community. Software engineering (SE) is concerned with developing and maintaining software systems that behave reliably and efficiently, are affordable to develop and maintain, and that satisfy all the requirements that customers have defined for them. This is important because of the impact of large, expensive software systems and the role of software in safety-critical applications. It integrates significant mathematics, computer science, and practices whose origins are in engineering.

The materials presented in this book include: advanced software engineering, systems analysis, software design and design patterns, advancements in engineering of systems, and case studies and emerging technologies.

OBJECTIVE OF THE BOOK

- To promote awareness of software engineering methodologies.
- To identify quality oriented software architecture (design and Support).
- To highlight educational establishment in information systems analysis and specification.
- To analyze advancements in engineering of systems.
- To analyze various approaches to software engineering.
- How software engineering helps for performance enhancement and appraisal.
- To analyze university-industry collaborations which may result in benefits to universities as well as industry, through complementary, as well as differing goals of each party?

The editors believe that the edited book presents the recent developments and discoveries in field of software engineering and offers important information for students and scientists in the community.

The book divided into four sections that reveal the main concepts examined in the book.

Section 1 throws light on aspects related to advanced software engineering which includes change management in shared software specifications; component certification process and standards; analyzing growth trends of reusable software components; and aspect-oriented recommender system.

Section 2 provides insight into systems analysis, software design, and design patterns. This section includes chapters on design of semi-structured database system: conceptual model to logical representation; a comparative study of Bayesian and fuzzy inference approach to assess quality of the software using
activity-based quality model; data mining techniques for software quality prediction; quality assurance of website structure; and resolving conflict in code refactoring.

Section 3 provides details related to advancements in engineering of systems and includes chapters such as Towards Test - Driven and Architecture Model Based Security and Resilience Engineering; Software Engineering, Process Improvement & Experience Management: Is the Nexus Productive? Clues from the Indian Giants; Usability engineering methods and tools; and Innovative Strategies for Secure Software Development.

Section 4 deals with how software engineering techniques can be used in case studies and emerging technologies. Case studies include secure web development; Galileo case study for collaborative design environment for the European Space Agency’s concurrent design facility; and version control in component-based systems.

The intended audience of this book is primarily researchers, research students and practitioners interested in the advances of software engineering. The book presents in a clear and accessible language a coherent integration of the different quality research papers ranging from conceptual to applied research. The resulting synthesis of experience and concepts will be of significant value to the academicians and researchers working in this emerging field. Thanks go to all those who provided constructive and comprehensive reviews.

We wish to thank all of the authors for their insights and excellent contributions to this edited book. We trust that this book will extend the thinking in software engineering and more broadly be of benefit to those who read it.

*Hardeep Singh*  
*Guru Nanak Dev University, India*

*Kulwant Kaur*  
*Apeejay Institute of Management, India*