

INTELLIGENT COMPUTING AND DIGITAL INNOVATION:

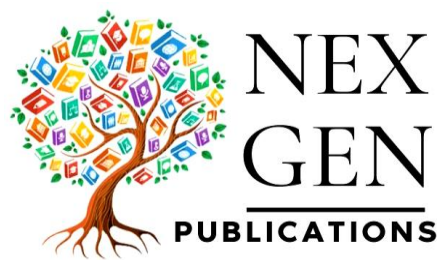
*Theories, Applications,
and Future Directions*



- Dr. Pooja Gupta
- Dr. Mitu Sehgal
- Mr. Manish Gulyani



Intelligent Computing and Digital Innovation: Theories, Applications, and Future Directions



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Intelligent Computing and Digital Innovation: Theories, Applications, and Future Directions

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Preface

The rapid evolution of computing technologies has transformed the way individuals, organisations, industries, and societies interact with information, solve problems, and create value. From artificial intelligence and machine learning to the Internet of Things, cloud computing, blockchain, data analytics, and emerging intelligent systems, digital technologies are increasingly becoming integral to contemporary economic and social development. In this context, **Intelligent Computing and Digital Innovation: Theories, Applications, and the Future** brings together diverse scholarly perspectives to explore the changing landscape of intelligent computing and its role in shaping digital innovation.

This edited volume has been conceptualised to provide a comprehensive platform for researchers, academicians, industry professionals, practitioners, and students to understand both the theoretical foundations and practical applications of intelligent computing. The book recognises that technological advancement is no longer limited to computational capabilities; rather, it encompasses new approaches to decision-making, innovation, organisational transformation, sustainability, entrepreneurship, education, healthcare, finance, and other domains.

The chapters included in this volume address a broad spectrum of contemporary themes related to intelligent computing and digital innovation. These include emerging technologies, artificial intelligence, machine learning, data-driven decision-making, digital transformation, automation, smart systems, cybersecurity, digital platforms, intelligent business solutions, and other emerging applications. The contributors have attempted to bridge the gap between theoretical understanding and practical implementation by highlighting real-world challenges, opportunities, and future possibilities.

A significant focus of this book is the interdisciplinary nature of intelligent computing. The impact of emerging technologies extends well beyond computer science and engineering, influencing management, commerce, education, healthcare, finance, manufacturing, governance, and society. Therefore, the chapters bring together perspectives from multiple disciplines to provide a holistic understanding of how intelligent technologies can be leveraged for innovation and sustainable development.

The book also explores the future direction of digital innovation. As intelligent technologies become increasingly autonomous and

interconnected, questions surrounding ethics, privacy, security, digital inclusion, responsible innovation, human–technology collaboration, and regulatory frameworks are becoming equally important. Technological progress must therefore be accompanied by responsible practices that ensure that innovation remains inclusive, sustainable, transparent, and beneficial to society.

This volume is intended not only to document current developments but also to stimulate critical thinking and further research. It may serve as a useful reference for academicians, researchers, students, policymakers, entrepreneurs, technology professionals, and organisations seeking to understand the implications of intelligent computing and digital innovation. The diversity of contributions reflects the rapidly changing nature of the field and encourages readers to explore new research directions and practical opportunities.

We sincerely hope that **Intelligent Computing and Digital Innovation: Theories, Applications, and the Future** will contribute to the growing body of knowledge in this dynamic field and encourage meaningful dialogue between academia, industry, and society. We believe that the future of intelligent computing lies not merely in technological sophistication but in its thoughtful and responsible application to address complex human and organisational challenges.

Editors

Dr. Pooja Gupta

Dr. Mitu Sehgal

Mr. Manish Gulyani

Acknowledgement

The successful completion of an edited volume is the result of the collective efforts, support, and cooperation of numerous individuals. We take this opportunity to express our sincere gratitude to everyone who contributed directly or indirectly to the development of **Intelligent Computing and Digital Innovation: Theories, Applications, and the Future**.

First and foremost, we express our heartfelt appreciation to all the **authors and contributors** who shared their valuable research, insights, experiences, and intellectual perspectives. Their scholarly contributions form the foundation of this volume and have enriched its multidisciplinary character. We are grateful for their commitment, patience, and cooperation throughout the submission, review, revision, and finalisation processes.

We sincerely thank the **reviewers and subject experts** for dedicating their valuable time to critically evaluate the submitted chapters. Their constructive suggestions, scholarly comments, and recommendations have significantly contributed to improving the academic quality, clarity, and relevance of the chapters included in this book.

We also extend our sincere gratitude to the **editorial and publishing team** for their continuous guidance and professional support throughout the various stages of the publication process. Their assistance in coordinating submissions, formatting, communication, and production has been invaluable in bringing this volume to completion.

Our special thanks go to the **academic institutions, departments, research committees, and colleagues** whose encouragement and academic environment supported the development of this work. Their continued emphasis on research, innovation, interdisciplinary collaboration, and knowledge creation has provided an encouraging foundation for this publication.

We are also grateful to our **research scholars, students, and academic peers**, whose curiosity, discussions, questions, and engagement with emerging technologies continue to inspire new ideas and perspectives. Their enthusiasm for learning and innovation reminds us of the importance of connecting technological advancement with meaningful academic and societal outcomes.

We acknowledge the contributions of the wider **research and technology community**, whose pioneering work in artificial intelligence, intelligent

computing, digital transformation, data science, automation, and emerging technologies has provided the intellectual context for this volume.

Finally, we express our deepest gratitude to our **families and well-wishers** for their constant encouragement, patience, understanding, and support during the preparation of this edited book. Their support has been an important source of motivation throughout the journey.

We sincerely appreciate everyone who contributed to making this book possible. We hope that this volume will serve as a meaningful academic resource and encourage further research, innovation, collaboration, and responsible application of intelligent computing and digital technologies.

Editors

Dr. Pooja Gupta

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About the Editors



Dr. Pooja Gupta is an Associate Professor at the Panipat Institute of Engineering and Technology, Samalkha, Haryana. She is a seasoned management professional with over 16 years of academic experience, specializing in Finance, Banking, and Accounting.

She earned her Ph.D. from Guru Jambheshwar University, Hisar, with a research focus on Foreign Investors and the Stock Market. Dr. Gupta has made significant contributions to academic research, with numerous publications in reputed national and international journals, and has actively participated in various conferences and seminars.

In addition to her research work, she has served as an editor for more than five academic books and has authored four books in her area of expertise. Her academic and research pursuits reflect a strong commitment to advancing knowledge in the field of finance and management.



Dr. Mitu Sehgal is currently working in the Department of Computer Science – Artificial Intelligence and Data Science at Panipat Institute of Engineering & Technology, Samalkha. She possesses more than 16 years of teaching experience in the field of Computer Science and Engineering. She obtained her Ph.D. in Wireless Body Area Networks (WBAN), with research focused on energy-efficient optimization techniques for improving network performance and power consumption in healthcare-based wireless communication systems.

She has presented and published numerous research papers in reputed national and international conferences and journals. Dr. Sehgal has also published books and book chapters in emerging areas of Computer Science and Artificial Intelligence. She has coordinated several conferences, workshops, and academic events at the institute level. She has actively participated in multiple Faculty Development Programs (FDPs) and workshops conducted at national and international platforms.

In addition, she has published several patents at both national and international levels. Her research interests include Machine Learning, Internet of Things (IoT), Wireless Body Area Networks, Energy Optimization Techniques, and Artificial Intelligence.



Mr Manish Gulyani is an accomplished academician with over 17 years of teaching experience in Management Education. He specialises in Business Statistics, Operations Research, Corporate Finance, and Accounting for Managers. He currently serves as Assistant Professor and Admission Convener (MBA/BBA) at Panipat Institute of Engineering & Technology (PIET).

He is pursuing his PhD in Business and Management Studies from Maharishi Markandeshwar University, Mullana, with expected completion in December 2026. Alongside teaching, he actively contributes to academic administration, admissions, alumni engagement, and accreditation processes (NAAC/NBA).

Mr Gulyani has published research papers in Scopus-indexed and peer-reviewed journals and has presented at national and international conferences. He also holds a published patent. He has coordinated academic conferences, faculty development programs, and management events, reflecting his strong commitment to academic excellence and student development.

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ABOUT THE BOOK

Intelligent Computing and Digital Innovation: Theories, Applications, and Future Directions explores the rapidly evolving landscape of intelligent technologies and their growing influence across industries, institutions, and society. The book brings together theoretical perspectives, practical applications, and emerging trends in computing, artificial intelligence, data-driven technologies, automation, digital transformation, and innovative digital solutions.

It provides readers with a comprehensive understanding of how intelligent computing is reshaping traditional approaches to problem-solving, decision-making, communication, business operations, and knowledge creation. By connecting fundamental concepts with contemporary applications, the book highlights the role of intelligent systems in developing efficient, adaptive, and sustainable solutions for complex real-world challenges.

The book also examines emerging directions in digital innovation, emphasizing opportunities created by advanced computational methods, interconnected systems, intelligent analytics, and technology-driven transformation. Particular attention is given to the relationship between technological innovation and its practical impact on organizations, education, research, business, and society.

Designed for researchers, academicians, educators, students, technology professionals, and industry practitioners, this book serves as a valuable reference for understanding current developments and future possibilities in intelligent computing. It encourages interdisciplinary thinking and provides insights into how emerging technologies can be responsibly integrated to create smarter systems, innovative practices, and meaningful digital futures.



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