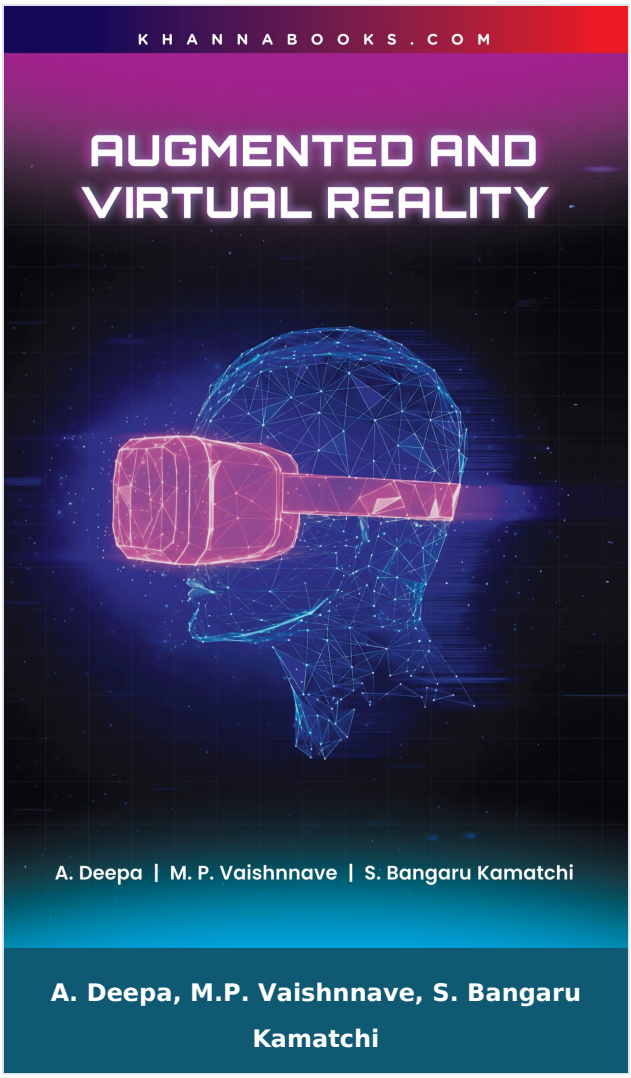

Augmented and Virtual Reality

Author :	A. Deepa, M.P. Vaishnnave, S. Bangaru Kamatchi
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Product Description

This book serves as a comprehensive guide to mastering the rapidly evolving world of Augmented Reality (AR) and Virtual Reality (VR), technologies that are fundamentally reshaping human-computer interaction. Designed to bridge the gap between theoretical knowledge and practical implementation, the core purpose of this text is to equip readers with the foundational concepts and hands-on expertise necessary to design, develop, and deploy functional AR/VR applications.

The journey begins with an exploration of the historical evolution, scope, and key distinctions of AR/VR, including the critical concepts of Immersion vs. Presence. It quickly progresses to essential design principles, focusing heavily on User Experience (UX), graphical metaphors, and prototyping within immersive environments. The practical value of this book is demonstrated through detailed instructional units on Unity, the industry-leading development platform, and its integration with the powerful AR toolset, Vuforia. Readers will gain proficiency in scripting, handling Unity Physics (Colliders and Rigidbodies), and creating interactive 3D experiences, culminating in a case study on real-time application development.

This resource is ideally intended for students, developers, designers, and enthusiasts seeking a strong, structured foothold in the AR/VR domain. It is an essential tool for those looking to harness these transformative technologies for applications across gaming, healthcare, education, and manufacturing.

Salient Features:

• Foundational Concepts: Covers the historical evolution, definitions, and scope of AR/VR, including multimodal displays and the key differentiation between Strong vs. Weak AR and Immersion vs. Presence.

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• Interaction Design: Dedicated focus on User Experience (UX) guidelines, perception, and cognition. It details how to design for user needs, apply Affordances, and perform prototype evaluation in AR/VR environments.

• Unity Development: Provides a comprehensive overview of the Unity platform, covering its interface, navigation, asset management, hierarchy, and fundamental scripting concepts using MonoBehaviours.

• Vuforia and AR: Explores the Vuforia development engine, detailing its features, setup process, and practical use for implementing Image Targeting and custom image recognition in AR applications.

• Scripting and Physics: Offers in-depth coverage of introductory and advanced scripting, focusing on manipulating components and programming interactions. It also introduces essential concepts of Unity Physics.

• Advanced Interactivity: Explains crucial implementation details like creating Trigger Events, using Colliders and Rigidbodies, and navigating world space for both objects and the user in the virtual environment.

• Real-World Applications: A final unit presents a Case Study on building a complete, real-time application using AR and VR, with applications demonstrated across fields like Education, Healthcare, and Retail.

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- Introduction to Augmented Reality and Virtual Reality
- Interaction for AR/VR Environments Design
- Introduction to Unity
- Introduction to Vuforia and Physics in Unity
- Expanding on Scripting and Interactions
- Sample Question Paper

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Artificial Intelligence

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Product Description

Artificial Intelligence serves as a comprehensive and structured guide to the fundamental principles, techniques, and transformative real-world applications of AI. Recognizing AI as one of the 21st century's most essential technologies, this book is an invaluable resource for mastering the concepts required to understand and develop intelligent systems. It is meticulously designed to guide readers from foundational concepts, such as the history of AI and the nature of intelligent agents, through increasingly sophisticated methodologies.

The core themes delve into problem-solving paradigms, including uninformed and informed search strategies like A* search, Hill Climbing, and Genetic Algorithms, alongside the critical aspects of optimal decision-making in competitive environments using techniques like Alpha-Beta Pruning. A significant portion is dedicated to Knowledge Representation and Reasoning, exploring formal logic (Propositional and First-Order), Ontological Engineering, and the mechanisms of logical inference like Forward and Backward Chaining. Furthermore, the text addresses acting logically in uncertain, real-world settings by utilizing Bayesian networks and decision theory to ensure rational planning.

By integrating theoretical foundations with practical implementation examples, this book is an essential resource for students, educators, researchers, and professionals seeking to bridge the gap between academic knowledge and the creation of intelligent systems capable of solving complex, real-world challenges.

Salient Features

• Search & Problem Solving: Details a full spectrum of search algorithms, including uninformed (BFS, DFS) and advanced heuristic strategies like A* search, Hill Climbing, and Simulated Annealing.

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• Game Theory Insights: Covers optimal decision-making strategies in adversarial environments, featuring comprehensive coverage of Minimax search and efficiency enhancement via Alpha-Beta Pruning.

• Logical Reasoning: Presents a deep dive into Knowledge Representation using First-Order Logic, Situation Calculus, and practical inference mechanisms like Forward and Backward Chaining.

• Uncertainty Handling: Explains Probabilistic Reasoning and Decision-Making in non-deterministic environments, focusing on the application of Bayes's rules and the semantics of Belief Networks.

• Planning Methodologies: Explores agent planning techniques from state-space search to Partial Order Planning (POP), offering methods for both theoretical plan representation and real-world action execution.

• Practical Learning:Promotes a holistic learning experience by blending theoretical depth with practical implementation through problem-solving exercises and complex real-world examples in each unit.

• AI Applications: Dedicates an entire unit to transformative applications like Natural Language Processing (NLP), Machine Translation, Information Retrieval, and core Robotics concepts.

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- Introduction and Problems Solving
- Informed Search and Game Playing
- Knowledge and Reasoning
- Acting Logically
- AI Applications

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