



ARTIFICIAL INTELLIGENCE

Fundamental Concepts, Techniques and Applications

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Artificial Intelligence

Fundamental Concepts, Techniques and Applications

First Edition

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PREFACE

In the ever-evolving landscape of technology, Artificial Intelligence (AI) stands at the forefront, shaping the way we live, work, and interact with the world. As we navigate through the second decade of the 21st century, the rapid advancements in AI have not only captivated our imaginations but have also presented a myriad of challenges and opportunities.

This book, "Artificial Intelligence Fundamental Concepts, Techniques and Applications" delves into the dynamic and multifaceted realm of AI, providing a comprehensive exploration of the latest trends, the formidable challenges faced by the field, and the diverse applications that are transforming industries and societies. As we venture deeper, we confront the challenges that accompany the rapid progress of AI. Ethical considerations, biases in algorithms, privacy concerns, and the socio-economic impact of automation are just a few of the critical issues explored in these chapters. The intent is not just to acknowledge these challenges but to foster a thoughtful discourse on how we, as a global community, can address them responsibly. We invite readers from various backgrounds – students, researchers, professionals, and enthusiasts – to embark on this intellectual journey. Whether you are new to the field or a seasoned expert, we hope that the insights shared within these pages will spark your curiosity, ignite discussions, and inspire you to contribute to the ongoing narrative of Artificial Intelligence.

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First and foremost, praises to God, the Almighty, for his immense shower of blessing and kindness throughout the work and has allowed us to finish successfully.

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We would also like to take the opportunity to express our special thanks of gratitude to the publisher for providing a golden chance by giving us the most awaited platform to showcase our novel work.

Any attempt at any level can't be satisfactorily completed without our students' collaborative effort, resulting in our Book being unique.

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ABOUT AUTHORS



Dr. Parul Saxena, Convener and Head of the Department of Computer Science at SSJ University in Almora, Uttarakhand, earned her M.Sc. in Computer Science from GBPUA&T, Pantnagar, and a Ph.D. from Kumaun University, Nainital. She has made noteworthy research contributions published in prestigious journals, including IEEE, Springer, and Taylor and Francis. Dr. Saxena has authored five books and holds seven patents, showcasing her dedication to both academia and innovation. In addition to her research accomplishments, Dr. Saxena has played a key role in organizing numerous national and state-level events, demonstrating her leadership and organizational skills. Actively participating in academic societies such as IUPRAI (Indian Unit for Pattern Recognition and Artificial Intelligence), ISCA (International Society for Computers and Their Applications), and SRBS (Society for Recent Advances in Biomedical Science) underscores her commitment to the academic community. Dr. Saxena's research focuses on Artificial Intelligence, Signal Processing, and Wavelet Theory, showcasing her expertise in cutting-edge & inter-disciplinary areas. Her diverse contributions and active engagement in academia highlight a well-rounded professional dedicated to advancing knowledge in the field of Computer Science.



Dr. Vinay Saxena is a renowned mathematician currently serving as the Principal and Professor at Kisan Postgraduate College, Bahraich, Uttar Pradesh. He holds advanced degrees from IIT Kanpur and GBPUAT Pantnagar, which provide a solid academic and research foundation. His research interests include Pattern Recognition, Machine Learning, and Numerical Analysis. He has authored numerous research papers published in various reputed journals and contributed to academic books and patents, demonstrating his significant impact in these domains. Dr. Saxena is committed to the advancement of mathematical sciences through both innovative research and dedicated teaching. He is an active member of several prestigious professional bodies, including IUPRAI, ISCA, IMS, RMS, ISHM, GANITA, and SRBS. His involvement in these organizations underscores his deep engagement with the scientific community and his efforts to promote interdisciplinary collaboration across mathematics, computer science, and engineering. Through his leadership, scholarship, and professional service, Dr. Saxena continues to contribute meaningfully to the growth of advanced mathematical research and education.



Dr. Sheela Hundekari, with an illustrious academic journey spanning over 25 years, is currently working at a renowned university, Pimpri-Chinchwad University, Pune. Dr. Hundekari embodies a remarkable blend of scholarly prowess and practical expertise. Armed with a Post-doctoral fellowship, a Ph.D. and a diverse array of qualifications, including an MBA, MCA, and MCM, their academic voyage has been marked by an insatiable thirst for knowledge and an unwavering commitment to excellence. Professor Dr. Hundekari is not merely confined to the academic realm; they have garnered acclaim on a global scale through their certifications and training endeavors. Holding seven prestigious certifications, including three in Java and two in Oracle, AWS and Azure Professor Dr. Sheela stands as a paragon of technical proficiency and industry relevance. Their designation as a NASSCOM Certified trainer further solidifies their status as a leading authority in the field. In addition to their instructional prowess, Professor Dr. Sheela Hundekari is an avid researcher, with a prolific portfolio of Scopus indexed, SCI, and SCEI research papers to her credit. Their contributions to the academic discourse have not only enriched their respective fields but have also spurred innovation and progress. With PhD students awarded under her valuable guidance in cloud computing and Data Science.



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