ADVANCED DEEP LEARNING ARCHITECTURES & TECHNIQUES

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Advanced Deep Learning Architectures & Techniques

First Edition

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Preface

Recent developments in area of machine learning and deep learning challenges, concept due to its diverse application has significantly created a new space of learning for students pursuing engineering at colleges and university.

Though a lot of material & information is available in public domain with respect to these bass words in terms of student perspective I find lack of any organized study material where in Basic concept of machine learning, deep learning & associated technology are available together vis-a-vis covering its diverse application & developmental research in the field of same.

In order to cater the basic requirement of student community. I have tried to include all the areas & perspective of the above technologies in context of its applications & adoption in machine learning and deep learning challenges, concept, and application.

Machine learning and Deep Learning is an integral part of many commercial applications and research projects today, in areas ranging from medical diagnosis and treatment to finding your friends on social networks. Many people think that machine learning can only be applied by large companies with extensive research teams. In this book, we want to show you how easy it can be to build machine learning solutions yourself, and how to best go about it. With the knowledge in this book, you can build your own system for finding out how people feel on Twitter, or making predictions about global warming. The applications of machine learning are endless and, with the amount of data available today, mostly limited by your imagination.

Acknowledgment

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.

We are sincerely grateful to our Institution Management, Director, Principal, Faculties, Students, and all our family members for providing continuous support and motivation during the work.

We would also like to take the opportunity to express our specials 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. Betshrine Rachel Jibinsingh is a biomedical AI researcher and author whose work bridges evolutionary computation, deep learning, and privacy-preserving techniques to transform medical imaging. As a Ph.D. graduate in Computer Science and Engineering from Anna University, India, she developed computer-aided diagnosis systems for pulmonary disorders, achieving over 91% accuracy in detecting COVID-19 and pulmonary edema from chest CT scans. Dr. Jibinsingh has published extensively in peer-reviewed journals. As a passionate educator, she has mentored master's students and led international workshops on medical image processing. Her writing weaves technical rigor with real-world impact, inviting readers into the evolving landscape of translational AI in healthcare.

Dr. Anurag Shrivastava, Professor & Post Doctoral at Lincoln University College (LUC), Malaysia, has been Listed in the World's Top 2% Scientists List by Stanford University, America and Elsevier Publishers released the list in September 2024. Dr. Shrivastava has published more than 210 SCOPUS Index Papers with 5300 citations. He has obtained more than 150 Grant patents from Australia, the UK, Canada, Germany, and South Africa. Under this, he was awarded by the Madhya Pradesh Council of Science and Technology and the National Intellectual Property Awareness Mission. Dr. Shrivastava's two books, "National Education Policy: 2020 Fundamentals and Challenges for Sustainable Education and Economic Growth in India" and "Fundamentals of IPR", were released by the Honorable Shri Inder Singh Parmar, Minister of Higher Education, Technical Education and AYUSH Department, Government of Madhya Pradesh. He has published more than 40 books. He has presented many Keynote Speakers and Session Chairs at International Conferences like IEEE and Springer. He has received more than 20 prestigious Awards at International and National Levels.

Dr. Nidal Al Said is an Assistant Professor of Information Technology at Ajman University, UAE, and holds a Ph.D. from the National Technical University of Athens. His research spans artificial intelligence, machine learning, data mining, human–computer interaction, and smart applications for education, media, business, and healthcare. A prolific scholar, he has authored several books and numerous peer-reviewed articles that translate complex technologies into clear, actionable insights. Collaborating with teams across Europe, North America, Asia, and the Gulf, he blends computing with multidisciplinary perspectives—including social sciences, design, and media—to address real-world challenges. Widely cited for methodological rigor and practical impact, Dr. Al Said is fluent in Arabic, English, and Greek, mentors early-career researchers worldwide, and integrates emerging technologies into learner-centred courses—all in pursuit of equitable, sustainable digital innovation.

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