

Make Your Own Neural Network By Tariq Rashid Goodreads

Make Your Own Neural Network By Tariq Rashid Goodreads Make Your Own Neural Network by Tariq Rashid Goodreads Make Your Own Neural Network by Tariq Rashid Goodreads is an influential book that introduces the fundamental concepts of neural networks and machine learning through accessible language and practical examples. Authored by Tariq Rashid, this book serves as an excellent starting point for beginners interested in understanding how neural networks work under the hood. It demystifies complex topics, making the journey into artificial intelligence both engaging and manageable. This article explores the core ideas presented in the book, provides insights into creating your own neural network, and highlights the importance of understanding the fundamentals in the rapidly evolving field of AI.

-- Introduction to Neural Networks What Is a Neural Network? A neural network is a computational model inspired by the structure and function of biological brains. It is designed to recognize patterns, learn from data, and make decisions or predictions. Neural networks are the backbone of many modern AI applications, including image recognition, natural language processing, and game playing. Why Learn About Neural Networks? Understanding neural networks is crucial because:

- They form the basis of deep learning algorithms.
- They enable machines to perform tasks that were once thought to require human intelligence.
- Learning to build your own neural network helps develop a deeper understanding of machine learning principles.

The Significance of Tariq Rashid's Approach Tariq Rashid's book is notable for its clear explanations, step-by-step guidance, and practical examples, making it a valuable resource for beginners who want to create their own neural networks from scratch.

--- Foundations of Neural Networks According to Tariq Rashid Biological Inspiration

- Neural networks are modeled after the human brain's interconnected neurons.
- Each neuron receives inputs, processes them, and passes output signals to other neurons.
- This biological analogy helps in designing artificial networks that can learn from

data. Basic Components of a Neural Network

1. Neurons (Nodes): Basic units that perform computations.
2. Weights: Parameters that determine the importance of each input.
3. Biases: Additional parameters that help the model fit the data.
4. Activation Functions: Functions that decide whether a neuron should activate or not.

Types of Neural Networks

- Single-Layer Perceptron: The simplest model, capable of solving linearly separable problems.
- Multi-Layer Perceptron (MLP): Contains multiple layers and can handle more complex tasks.
- Deep Neural Networks: Comprise many layers, enabling learning of complex patterns.

--- Building Your First Neural Network

Step-by-Step Approach Tariq Rashid emphasizes a hands-on approach to building neural networks, which involves:

- Understanding the mathematical foundations.
- Implementing simple models in code.
- Experimenting with different parameters.

Tools and Programming Languages

- Python: The most popular language for machine learning.
- Libraries: Such as NumPy for numerical operations and Matplotlib for visualization.

Creating a Simple Neural Network Example: XOR Problem

The XOR (exclusive OR) problem is a classic challenge for neural networks, illustrating the need for multi-layer models.

Steps:

1. Define input data and expected outputs.
2. Initialize weights and biases randomly.
3. Use an activation function like sigmoid.
4. Implement forward propagation.
5. Calculate error.
6. Apply backpropagation to adjust weights.
7. Repeat until the network learns the pattern.

Sample Python Code Snippet

```
python import numpy as np
Define sigmoid activation function def sigmoid(x): return 1 / (1 +
np.exp(-x)) Derivative of sigmoid def sigmoid_derivative(x): return x
(1 - x) Input dataset for XOR inputs = np.array([[0,0], [0,1], [1,0],
[1,1]]) Output dataset outputs = np.array([[0], [1], [1], [0]])
Initialize weights randomly np.random.seed(1) weights_input_hidden =
2 np.random.random((2, 2)) - 1 weights_hidden_output = 2
np.random.random((2, 1)) - 1 learning_rate = 0.5 Training loop for
epoch in range(10000): Forward propagation layer_input = inputs
hidden_layer_input = np.dot(layer_input, weights_input_hidden)
hidden_layer_output = sigmoid(hidden_layer_input) final_layer_input =
np.dot(hidden_layer_output, weights_hidden_output) final_output =
sigmoid(final_layer_input) Calculate error error = outputs -
final_output if epoch % 1000 == 0: print(f"Epoch {epoch} Error:
{np.mean(np.abs(error))}") Backpropagation delta_output = error
sigmoid_derivative(final_output) error_hidden_layer =
```

```
delta_output.dot(weights_hidden_output.T) delta_hidden_layer =
error_hidden_layer sigmoid_derivative(hidden_layer_output) Update
weights weights_hidden_output +=
hidden_layer_output.T.dot(delta_output) learning_rate
weights_input_hidden += layer_input.T.dot(delta_hidden_layer)
learning_rate ``` This code demonstrates the core concepts of neural
network training—initialization, forward propagation, error
calculation, backpropagation, and weight updating. --- Understanding
and Implementing the Core Concepts Activation Functions Activation
functions introduce non-linearity, enabling neural networks to learn
complex patterns. - Sigmoid: S-shaped curve, outputs between 0 and 1.
- ReLU (Rectified Linear Unit): Outputs zero for negative inputs,
linear for positive. - Tanh: Outputs between -1 and 1, zero-centered.
Tariq Rashid stresses the importance of choosing the right activation
function depending on the problem. Learning Algorithms - Gradient
Descent: The foundational algorithm for training neural networks. -
Backpropagation: Efficient method for computing gradients needed for
gradient descent. Loss Functions Quantify how well the neural network
performs. - Mean Squared Error (MSE): Common for regression tasks. -
Cross-Entropy Loss: Used for classification problems. --- Practical
Tips for Building Neural Networks Data Preparation - Normalize or
standardize data. - Split data into training, validation, and testing
sets. - Augment data if necessary. Hyperparameter Tuning - Learning
rate - Number of layers and neurons - Activation functions - Number
of epochs Avoiding Overfitting - Use regularization 3 techniques like
dropout. - Monitor validation error. - Use early stopping. ---
Advanced Topics Inspired by Tariq Rashid Deep Learning and Multiple
Layers - As networks deepen, they can learn more abstract features. -
Requires careful tuning and more computational power. Convolutional
Neural Networks (CNNs) - Specialized for image data. - Use filters to
detect features like edges and shapes. Recurrent Neural Networks
(RNNs) - Suitable for sequence data like text or time series.
Transfer Learning - Use pre-trained models and fine-tune on specific
tasks. --- Resources and Further Reading Recommended Books and
Courses - "Make Your Own Neural Network" by Tariq Rashid: The
foundational resource. - Online courses on Coursera, Udacity, or edX.
- Open-source tutorials and repositories. Community and Support -
Join forums like Stack Overflow, Reddit's r/MachineLearning. -
Participate in Kaggle competitions to practice. --- Conclusion
```

Building your own neural network is a rewarding journey that deepens your understanding of artificial intelligence. Tariq Rashid's book provides a clear roadmap for beginners to grasp the essential concepts and implement simple models. By understanding the biological inspiration, mathematical foundations, and practical implementation steps, you can start experimenting with neural networks and take your first steps into the exciting world of machine learning. As you progress, exploring more advanced architectures and techniques will open doors to solving complex real-world problems. Remember, the key is to start simple, learn continuously, and keep experimenting. ---

Final Thoughts Creating your own neural network from scratch is more than just coding; it is about developing an intuition for how machines learn. Tariq Rashid's approachable style makes this complex subject accessible, empowering newcomers to demystify AI. Whether you aim to build simple models or delve into deep learning, understanding the core principles outlined in his book is essential. Embrace the learning process, experiment relentlessly, and contribute to the growing field of artificial intelligence with curiosity and confidence.

Question What is the main focus of 'Make Your Own Neural Network' by Tariq Rashid? The book aims to teach readers the fundamentals of neural networks and how to build them from scratch using simple, accessible explanations and practical examples. Is 'Make Your Own Neural Network' suitable for beginners with no prior coding experience? Yes, the book is designed for beginners and explains concepts in a straightforward manner, making it accessible even for those new to programming and neural networks. What programming language is used in 'Make Your Own Neural Network'? The book primarily uses Python to demonstrate the implementation of neural networks, leveraging its simplicity and widespread use in AI development. Does Tariq Rashid's book include practical projects or exercises? Yes, the book contains hands-on projects and coding exercises that help readers understand how to build and train neural networks step by step.

4 Are there any prerequisites to understand 'Make Your Own Neural Network'? Basic knowledge of mathematics and programming is helpful but not mandatory, as the book starts with foundational concepts and guides readers through the process. How does 'Make Your Own Neural Network' compare to other beginner AI books? It is praised for its clear explanations, practical approach, and focus on building intuition, making it a popular choice for

newcomers to AI and neural networks. Can readers expect to build a fully functional neural network after reading the book? Yes, the book guides readers through creating a simple neural network from scratch, providing a solid understanding of how these models work. Is 'Make Your Own Neural Network' still relevant in 2024 considering the advancements in AI? Absolutely, as it covers fundamental principles of neural networks that underpin more advanced AI models, making it a valuable starting point for learning. Where can I find 'Make Your Own Neural Network' by Tariq Rashid for purchase or reading? You can find the book on major online retailers like Goodreads, Amazon, and local bookstores, as well as in digital and physical formats. Make Your Own Neural Network by Tariq Rashid is a compelling introductory guide for anyone interested in understanding the fundamentals of neural networks and machine learning. As a beginner-friendly book, it aims to demystify complex concepts through clear explanations, practical examples, and approachable language. Published with the intent of making AI accessible to newcomers, the book has garnered positive reviews for its straightforward teaching style and hands-on approach. In this review, we will explore the main features of the book, its strengths and weaknesses, and discuss how it fits into the broader landscape of educational resources on neural networks. --- Overview of the Book "Make Your Own Neural Network" by Tariq Rashid is designed as an introductory text that guides readers through the process of building a simple neural network from scratch. The book emphasizes understanding core concepts rather than diving into advanced mathematics or complex programming. Rashid's goal is to make neural networks approachable and engaging, especially for readers with little to no prior experience in machine learning or programming. The book balances theoretical explanations with practical coding exercises, primarily using Python. It introduces foundational ideas such as neurons, activation functions, training algorithms, and error correction, all explained with clear diagrams and simplified language. The ultimate aim is for readers to gain enough knowledge to create and experiment with their own neural networks, fostering curiosity and foundational understanding. --- Make Your Own Neural Network By Tariq Rashid Goodreads 5 Content Breakdown Introduction to Neural Networks The book starts with an intuitive explanation of what neural networks are, comparing them to the human brain's structure. Rashid discusses how biological neurons

work and draws parallels to artificial neurons, making the abstract concept more relatable. This section emphasizes the importance of pattern recognition and learning in neural networks.

Building Blocks: Neurons and Layers Readers learn about the basic units of neural networks: neurons, weights, biases, and activation functions. Rashid describes how neurons process inputs and produce outputs, and how layers of neurons are organized. Diagrams and simple code snippets help clarify how signals propagate through the network.

Training Neural Networks This section introduces the key idea of teaching the network through training data. Rashid explains the concept of error correction, gradient descent, and how the network adjusts weights to improve accuracy. The book simplifies the mathematics involved, focusing instead on the intuition behind learning algorithms.

Practical Implementation The core of the book involves building a neural network in Python, with step-by-step instructions. Readers learn to implement forward propagation, error calculation, and weight updates. The code examples are designed to be accessible, with explanations accompanying each snippet. The book also includes exercises to reinforce understanding.

Applications and Further Topics Towards the end, Rashid discusses possible applications of neural networks, such as image recognition, speech processing, and gaming. The book briefly touches on more advanced topics like multiple layers and deep learning, encouraging readers to explore further.

--- **Strengths of the Book** - **Beginner-Friendly Language:** Rashid writes in a conversational style that makes complex ideas understandable without oversimplification. The use of analogies and visual aids enhances comprehension. - **Hands-On Approach:** The emphasis on building a neural network from scratch in Python allows readers to see the direct connection between theory and implementation. This practical focus helps solidify learning. - **Clear Illustrations and Diagrams:** Visual aids are used throughout the book to demonstrate how signals flow through the network and how adjustments improve performance. - **Focus on Core Concepts:** Rather than overwhelming readers with advanced mathematics, the book focuses on intuition and fundamental principles, making it suitable for complete beginners. - **Encourages Experimentation:** Simple exercises and projects foster a hands-on learning experience, encouraging readers to modify and experiment with their code. --- **Weaknesses and Limitations** - **Simplification of**

Mathematics: While this is a strength for beginners, some readers seeking a rigorous mathematical understanding may find the explanations lacking depth. - Limited Scope: The book covers only basic neural networks and does not delve into more advanced topics such as deep learning architectures, convolutional neural networks, or optimization techniques. - Code Examples Are Basic: The Python code provided is intentionally simple, which might not be directly applicable for real-world applications or large datasets without significant modification. - Potential Outdatedness: Given the rapid evolution of AI, some techniques or terminology may be somewhat simplified or not reflect the latest developments in neural network research. --- Features and Highlights - Accessible Introduction: Perfect for absolute beginners with minimal technical background. - Progressive Learning Curve: Starts from fundamental concepts and gradually introduces more complex ideas. - Practical Coding Exercises: Builds confidence through hands-on projects. - Encourages Curiosity: Inspires readers to explore further in AI and machine learning. - User-Friendly Layout: Clear chapters, summaries, and diagrams facilitate easy navigation and understanding. --- Comparison with Other Resources Compared to more comprehensive textbooks like "Deep Learning" by Ian Goodfellow or "Neural Networks and Deep Learning" by Michael Nielsen, Rashid's book is less technical but more approachable for beginners. It serves as an excellent starting point before diving into more advanced materials. Online tutorials and courses often focus on specific frameworks like TensorFlow or PyTorch, which require prior understanding of neural network fundamentals. Rashid's book fills the gap by providing foundational knowledge that makes subsequent learning smoother. --- Who Should Read This Book? - Complete beginners interested in understanding how neural networks work. - Students Make Your Own Neural Network By Tariq Rashid Goodreads 7 exploring AI and machine learning as part of their coursework. - Hobbyists wanting to build their own simple neural networks for experimentation. - Educators seeking a gentle introduction to neural network concepts. --- Pros and Cons Summary Pros: - Easy-to-understand language and explanations - Practical, step-by-step coding guidance - Visual aids that clarify complex ideas - Encourages experimentation and curiosity - Suitable for beginners with no prior experience Cons: - Lacks depth in mathematical rigor - Limited coverage of advanced topics - Basic code examples may require

adaptation for complex projects - Might become outdated as AI evolves rapidly --- Final Thoughts "Make Your Own Neural Network" by Tariq Rashid is an excellent starting point for anyone new to artificial intelligence and machine learning. Its accessible approach, combined with practical coding exercises, demystifies the process of building neural networks and lays a solid foundation for further exploration. While it does not dive into the depths of deep learning architectures or optimization techniques, it effectively introduces core concepts essential for understanding more complex models. For learners seeking an engaging, straightforward introduction that emphasizes understanding over technical complexity, this book is highly recommended. It acts as a stepping stone that can boost confidence and inspire further study into advanced AI topics. If you're new to neural networks and want a clear, concise, and practical guide, "Make Your Own Neural Network" by Tariq Rashid is a valuable resource worth exploring. neural network tutorial, Tariq Rashid neural networks, machine learning books, beginner neural networks, how to build neural networks, deep learning guide, artificial intelligence books, programming neural networks, neural network for beginners, goodreads neural network books

Hands-On Neural NetworksNeural Networks with RNeural Networks for BeginnersArtificial Neural NetworksIntroduction to Artificial Neural NetworksArtificial Neural NetworksHands-On Neural NetworksAn Introduction to Neural NetworksNeural NetworksNeural Network Learning and Expert SystemsNeural Networks and Deep LearningPrinciples of Artificial Neural NetworksDeep Learning with PyTorchPrinciples Of Artificial Neural Networks: Basic Designs To Deep Learning (4th Edition)Deep Neural Network ApplicationsNeural NetworksNeural NetworksNeural Networks with Keras CookbookNeural NetworksConvolutional Neural Networks In Python Leonardo De Marchi Giuseppe Ciaburro Russel R Russo Joao Luis Garcia Rosa Sivanandam S., Paulraj M Robert J. Schalkoff Leonardo De Marchi Kevin Gurney Richard J. Mammone Stephen I. Gallant Charu C. Aggarwal Daniel Graupe Vishnu Subramanian Daniel Graupe Hasmik Osipyan Berndt Müller Steven Cooper V Kishore Ayyadevara Raul Rojas Frank Millstein Hands-On Neural Networks Neural Networks with R Neural Networks for Beginners Artificial Neural Networks Introduction to Artificial Neural Networks Artificial Neural Networks Hands-On Neural Networks

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design and create neural networks with deep learning and artificial intelligence principles using openai gym tensorflow and keras key features explore neural network architecture and understand how it functions learn algorithms to solve common problems using back propagation and perceptrons understand how to apply neural networks to applications with the help of useful illustrations book description neural networks play a very important role in deep learning and artificial intelligence ai with applications in a wide variety of domains right from medical diagnosis to financial forecasting and even machine diagnostics hands on neural networks is designed to guide you through learning about neural networks in a practical way the book will get you started by giving you a brief introduction to perceptron networks you will then gain insights into machine learning and also understand what the future of ai could look like next you will study how embeddings can be used to process textual data and the role of long short term memory networks lstms in helping you solve common natural language processing nlp problems the later chapters will demonstrate how you can implement advanced concepts including transfer learning generative adversarial networks gans autoencoders and reinforcement learning finally you can look forward to further content on the latest advancements in the field of neural networks by the end of this book you will have the skills you need to build train and optimize your own neural network model that can be used to provide predictable solutions what you will learn learn how to train a network by using backpropagation discover how to load and transform images for use in neural networks study how neural networks can be

applied to a varied set of applications solve common challenges faced in neural network development understand the transfer learning concept to solve tasks using keras and visual geometry group vgg network get up to speed with advanced and complex deep learning concepts like lstms and nlp explore innovative algorithms like gans and deep reinforcement learning who this book is for if you are interested in artificial intelligence and deep learning and want to further your skills then this intermediate level book is for you some knowledge of statistics will help you get the most out of this book

uncover the power of artificial neural networks by implementing them through r code about this book develop a strong background in neural networks with r to implement them in your applications build smart systems using the power of deep learning real world case studies to illustrate the power of neural network models who this book is for this book is intended for anyone who has a statistical background with knowledge in r and wants to work with neural networks to get better results from complex data if you are interested in artificial intelligence and deep learning and you want to level up then this book is what you need what you will learn set up r packages for neural networks and deep learning understand the core concepts of artificial neural networks understand neurons perceptrons bias weights and activation functions implement supervised and unsupervised machine learning in r for neural networks predict and classify data automatically using neural networks evaluate and fine tune the models you build in detail neural networks are one of the most fascinating machine learning models for solving complex computational problems efficiently neural networks are used to solve wide range of problems in different areas of ai and machine learning this book explains the niche aspects of neural networking and provides you with foundation to get started with advanced topics the book begins with neural network design using the neural net package then you ll build a solid foundation knowledge of how a neural network learns from data and the principles behind it this book covers various types of neural network including recurrent neural networks and convoluted neural networks you will not only learn how to train neural networks but will also explore generalization of these networks later we will delve into combining different neural network models and work with the real world use cases by the end of

this book you will learn to implement neural network models in your applications with the help of practical examples in the book style and approach a step by step guide filled with real world practical examples

do you want to understand neural networks and learn everything about them but it looks like it is an exclusive club are you fascinated by artificial intelligence but you think that it would be too difficult for you to learn if you think that neural networks and artificial intelligence are the present and even more the future of technology and you want to be part of it well you are in the right place and you are looking at the right book if you are reading these lines you have probably already noticed this artificial intelligence is all around you your smartphone that suggests you the next word you want to type your netflix account that recommends you the series you may like or spotify s personalised playlists this is how machines are learning from you in everyday life and these examples are only the surface of this technological revolution either if you want to start your own ai enterprise to empower your business or to work in the greatest and most innovative companies artificial intelligence is the future and neural networks programming is the skill you want to have the good news is that there is no exclusive club you can easily if you commit of course learn how to program and use neural networks and to do that neural networks for beginners is the perfect way in this book you will learn the types and components of neural networks the smartest way to approach neural network programming why algorithms are your friends the three vs of big data plus two new vs how machine learning will help you making predictions the three most common problems with neural networks and how to overcome them even if you don t know anything about programming neural networks is the perfect place to start now still if you already know about programming but not about how to do it in artificial intelligence neural networks are the next thing you want to learn and neural networks for beginners is the best way to do it download neural network for beginners now to get the best start for your journey to artificial intelligence scroll to the top of the page and click the buy now button

the idea of simulating the brain was the goal of many pioneering works in artificial intelligence the brain has been seen as a neural

network or a set of nodes or neurons connected by communication lines currently there has been increasing interest in the use of neural network models this book contains chapters on basic concepts of artificial neural networks recent connectionist architectures and several successful applications in various fields of knowledge from assisted speech therapy to remote sensing of hydrological parameters from fabric defect classification to application in civil engineering this is a current book on artificial neural networks and applications bringing recent advances in the area to the reader interested in this always evolving machine learning technique

this fundamental book on artificial neural networks has its emphasis on clear concepts ease of understanding and simple examples written for undergraduate students the book presents a large variety of standard neural networks with architecture algorithms and applications

while the primary objective of the text is to provide a teaching tool practicing engineers and scientists are likely to find the clear concept based treatment useful in updating their backgrounds

design and create neural networks with deep learning and artificial intelligence principles using openai gym tensorflow and keras key features explore neural network architecture and understand how it functions learn algorithms to solve common problems using back propagation and perceptrons understand how to apply neural networks to applications with the help of useful illustrations book description neural networks play a very important role in deep learning and artificial intelligence ai with applications in a wide variety of domains right from medical diagnosis to financial forecasting and even machine diagnostics hands on neural networks is designed to guide you through learning about neural networks in a practical way the book will get you started by giving you a brief introduction to perceptron networks you will then gain insights into machine learning and also understand what the future of ai could look like next you will study how embeddings can be used to process textual data and the role of long short term memory networks lstms in helping you solve common natural language processing nlp problems the later chapters will demonstrate how you can implement advanced

concepts including transfer learning generative adversarial networks gans autoencoders and reinforcement learning finally you can look forward to further content on the latest advancements in the field of neural networks by the end of this book you will have the skills you need to build train and optimize your own neural network model that can be used to provide predictable solutions what you will learn learn how to train a network by using backpropagation discover how to load and transform images for use in neural networks study how neural networks can be applied to a varied set of applications solve common challenges faced in neural network development understand the transfer learning concept to solve tasks using keras and visual geometry group vgg network get up to speed with advanced and complex deep learning concepts like lstms and nlp explore innovative algorithms like gans and deep reinforcement learning who this book is for if you are interested in artificial intelligence and deep learning and want to further your skills then this intermediate level book is for you some knowledge of statistics will help you get the most out of this book

though mathematical ideas underpin the study of neural networks the author presents the fundamentals without the full mathematical apparatus all aspects of the field are tackled including artificial neurons as models of their real counterparts the geometry of network action in pattern space gradient descent methods including back propagation associative memory and hopfield nets and self organization and feature maps the traditionally difficult topic of adaptive resonance theory is clarified within a hierarchical description of its operation the book also includes several real world examples to provide a concrete focus this should enhance its appeal to those involved in the design construction and management of networks in commercial environments and who wish to improve their understanding of network simulator packages as a comprehensive and highly accessible introduction to one of the most important topics in cognitive and computer science this volume should interest a wide range of readers both students and professionals in cognitive science psychology computer science and electrical engineering

neural networks have attracted the interest of scientists from many disciplines engineering computer science mathematics physics biology

and cognitive science this volume collects 15 contributions written by leading international researchers that illustrate important features of various neural network methodologies topics discussed include the fundamental principles of neural networks and various modifications of basic neural systems that improve system performance in specific application domains where appropriate improvements are demonstrated by numerical examples

presents a unified and in depth development of neural network learning algorithms and neural network expert systems

this book covers both classical and modern models in deep learning the primary focus is on the theory and algorithms of deep learning the theory and algorithms of neural networks are particularly important for understanding important concepts so that one can understand the important design concepts of neural architectures in different applications why do neural networks work when do they work better than off the shelf machine learning models when is depth useful why is training neural networks so hard what are the pitfalls the book is also rich in discussing different applications in order to give the practitioner a flavor of how neural architectures are designed for different types of problems applications associated with many different areas like recommender systems machine translation image captioning image classification reinforcement learning based gaming and text analytics are covered the chapters of this book span three categories the basics of neural networks many traditional machine learning models can be understood as special cases of neural networks an emphasis is placed in the first two chapters on understanding the relationship between traditional machine learning and neural networks support vector machines linear logistic regression singular value decomposition matrix factorization and recommender systems are shown to be special cases of neural networks these methods are studied together with recent feature engineering methods like word2vec fundamentals of neural networks a detailed discussion of training and regularization is provided in chapters 3 and 4 chapters 5 and 6 present radial basis function rbf networks and restricted boltzmann machines advanced topics in neural networks chapters 7 and 8 discuss recurrent neural networks and convolutional neural networks several advanced topics like deep reinforcement

learning neural turing machines kohonen self organizing maps and generative adversarial networks are introduced in chapters 9 and 10 the book is written for graduate students researchers and practitioners numerous exercises are available along with a solution manual to aid in classroom teaching where possible an application centric view is highlighted in order to provide an understanding of the practical uses of each class of techniques

artificial neural networks are most suitable for solving problems that are complex ill defined highly nonlinear of many and different variables and or stochastic such problems are abundant in medicine in finance in security and beyond this volume covers the basic theory and architecture of the major artificial neural networks uniquely it presents 18 complete case studies of applications of neural networks in various fields ranging from cell shape classification to micro trading in finance and to constellation recognition oco all with their respective source codes these case studies demonstrate to the readers in detail how such case studies are designed and executed and how their specific results are obtained the book is written for a one semester graduate or senior level undergraduate course on artificial neural networks it is also intended to be a self study and a reference text for scientists engineers and for researchers in medicine finance and data mining

build neural network models in text vision and advanced analytics using pytorch key features learn pytorch for implementing cutting edge deep learning algorithms train your neural networks for higher speed and flexibility and learn how to implement them in various scenarios cover various advanced neural network architecture such as resnet inception densenet and more with practical examples book description deep learning powers the most intelligent systems in the world such as google voice siri and alexa advancements in powerful hardware such as gpus software frameworks such as pytorch keras tensorflow and cntk along with the availability of big data have made it easier to implement solutions to problems in the areas of text vision and advanced analytics this book will get you up and running with one of the most cutting edge deep learning libraries pytorch pytorch is grabbing the attention of deep learning researchers and data science professionals due to its accessibility efficiency and

being more native to python way of development you ll start off by installing pytorch then quickly move on to learn various fundamental blocks that power modern deep learning you will also learn how to use cnn rnn lstm and other networks to solve real world problems this book explains the concepts of various state of the art deep learning architectures such as resnet densenet inception and seq2seq without diving deep into the math behind them you will also learn about gpu computing during the course of the book you will see how to train a model with pytorch and dive into complex neural networks such as generative networks for producing text and images by the end of the book you ll be able to implement deep learning applications in pytorch with ease what you will learn use pytorch for gpu accelerated tensor computations build custom datasets and data loaders for images and test the models using torchvision and torchtext build an image classifier by implementing cnn architectures using pytorch build systems that do text classification and language modeling using rnn lstm and gru learn advanced cnn architectures such as resnet inception densenet and learn how to use them for transfer learning learn how to mix multiple models for a powerful ensemble model generate new images using gan s and generate artistic images using style transfer who this book is for this book is for machine learning engineers data analysts data scientists interested in deep learning and are looking to explore implementing advanced algorithms in pytorch some knowledge of machine learning is helpful but not a mandatory need working knowledge of python programming is expected

the field of artificial neural networks is the fastest growing field in information technology and specifically in artificial intelligence and machine learning this must have compendium presents the theory and case studies of artificial neural networks the volume with 4 new chapters updates the earlier edition by highlighting recent developments in deep learning neural networks which are the recent leading approaches to neural networks uniquely the book also includes case studies of applications of neural networks demonstrating how such case studies are designed executed and how their results are obtained the title is written for a one semester graduate or senior level undergraduate course on artificial neural networks it is also intended to be a self study and a reference text for scientists engineers and for researchers in medicine finance and data mining

the world is on the verge of fully ushering in the fourth industrial revolution of which artificial intelligence ai is the most important new general purpose technology like the steam engine that led to the widespread commercial use of driving machineries in the industries during the first industrial revolution the internal combustion engine that gave rise to cars trucks and airplanes electricity that caused the second industrial revolution through the discovery of direct and alternating current and the internet which led to the emergence of the information age ai is a transformational technology it will cause a paradigm shift in the way s problems are solved in every aspect of our lives and from it innovative technologies will emerge ai is the theory and development of machines that can imitate human intelligence in tasks such as visual perception speech recognition decision making and human language translation this book provides a complete overview on the deep learning applications and deep neural network architectures it also gives an overview on most advanced future looking fundamental research in deep learning application in artificial intelligence research overview includes reasoning approaches problem solving knowledge representation planning learning natural language processing perception motion and manipulation social intelligence and creativity it will allow the reader to gain a deep and broad knowledge of the latest engineering technologies of ai and deep learning and is an excellent resource for academic research and industry applications

neural networks presents concepts of neural network models and techniques of parallel distributed processing in a three step approach a brief overview of the neural structure of the brain and the history of neural network modeling introduces to associative memory preceptrons feature sensitive networks learning strategies and practical applications the second part covers subjects like statistical physics of spin glasses the mean field theory of the hopfield model and the space of interactions approach to the storage capacity of neural networks the final part discusses nine programs with practical demonstrations of neural network models the software and source code in c are on a 3 1 2 ms dos diskette can be run with microsoft borland turbo c or compatible compilers

the best neural networks book for beginners if you are looking for a

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neural networks are a computing paradigm that is finding increasing attention among computer scientists in this book theoretical laws and models previously scattered in the literature are brought together into a general theory of artificial neural nets always with a view to biology and starting with the simplest nets it is shown how the properties of models change when more general computing elements and net topologies are introduced each chapter contains examples numerous illustrations and a bibliography the book is aimed at readers who seek an overview of the field or who wish to deepen their knowledge

it is suitable as a basis for university courses in neurocomputing

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