

A Neural Algorithm Of Artistic Style Arxiv

"Within the fields of visual effects and animation, humans have historically spent countless painstaking hours mastering the skill of drawing frame-by-frame animations. One such animation technique that has been widely used in the animation and visual effects industry is called 'rotoscoping' and has allowed uniquely stylized animations to capture the motion of real life action sequences, however it is a very complex and time consuming process. Automating this arduous technique would free animators from performing frame by frame stylization and allow them to concentrate on their own artistic contributions. This thesis introduces a new artificial system based on an existing neural style transfer method which creates artistically stylized animations that simultaneously reproduce both the motion of the original videos that they are derived from and the unique style of a given artistic work. This system utilizes a convolutional neural network framework to extract a hierarchy of image features used for generating images that appear visually similar to a given artistic style while at the same time faithfully preserving temporal content. The use of optical flow allows the combination of style and content to be integrated directly with the apparent motion over frames of a video to produce smooth and visually appealing transitions. The implementation described in this thesis demonstrates how biologically-inspired systems such as convolutional neural networks are rapidly approaching human-level behavior in tasks that were once thought impossible for computers. Such a complex task elucidates the current and future technical and artistic capabilities of such biologically-inspired neural systems as their horizons expand exponentially. Further, this research provides unique insights into the way that humans perceive and utilize temporal information in everyday tasks. A secondary implementation that is explored in this thesis seeks to improve existing convolutional neural networks using a biological approach to the way these models adapt to their inputs. This implementation shows how these pattern recognition systems can be greatly improved by integrating recent neuroscience research into already biologically inspired systems. Such a novel hybrid activation function model replicates recent findings in the field of neuroscience and shows significant advantages over existing static activation functions."--Abstract.

This book constitutes the refereed proceedings of the 11th International ICT Innovations Conference, ICT Innovations 2019, held in Ohrid, Macedonia, in October 2019. The 18 full papers presented were carefully reviewed and selected from 75 submissions. They cover the following topics: sensor applications and deployments, embedded and cyber-physical systems, robotics, network architectures, cloud computing, software infrastructure, software creation and management, models of computation, computational complexity and cryptography, design and analysis of algorithms, mathematical optimization, probability and statistics, data management systems, data mining, human computer interaction (HCI), artificial intelligence, machine learning, life and medical sciences, health care information systems, bioinformatics.

This book constitutes the thoroughly refereed proceedings of the 15th International Conference on Image Analysis and Recognition, ICIAR 2018, held in Póvoa de Varzim, Portugal, in June 2018. The 91 full papers presented together with 15 short papers were carefully reviewed and selected from 179 submissions. The papers are organized in the following topical sections: Enhancement, Restoration and Reconstruction, Image Segmentation, Detection, Classification and Recognition, Indexing and Retrieval, Computer Vision, Activity Recognition, Traffic and Surveillance, Applications, Biomedical Image Analysis, Diagnosis and Screening of Ophthalmic Diseases, and Challenge on Breast Cancer Histology Images.

Generative Modelle haben sich zu einem der spannendsten Themenbereiche der Künstlichen Intelligenz entwickelt: Mit generativem Deep Learning ist es inzwischen möglich, einer Maschine das Malen, Schreiben oder auch das Komponieren von Musik beizubringen – kreative Fähigkeiten, die bisher dem Menschen vorbehalten waren. Mit diesem praxisnahen Buch können Data Scientists einige der eindrucksvollsten generativen Deep-Learning-Modelle nachbilden, wie z.B. Generative Adversarial Networks (GANs), Variational Autoencoder (VAEs), Encoder-Decoder- sowie World-Modelle. David Foster vermittelt zunächst die Grundlagen des Deep Learning mit Keras und veranschaulicht die Funktionsweise jeder Methode, bevor er zu einigen der modernsten Algorithmen auf diesem Gebiet vorstößt. Die zahlreichen praktischen Beispiele und Tipps helfen Ihnen herauszufinden, wie Ihre Modelle noch effizienter lernen und noch kreativer werden können. - Entdecken Sie, wie Variational Autoencoder den Gesichtsausdruck auf Fotos verändern können - Erstellen Sie praktische GAN-Beispiele von Grund auf und nutzen Sie CycleGAN zur Stilübertragung und MuseGAN zum Generieren von Musik - Verwenden Sie rekurrente generative Modelle, um Text zu erzeugen, und lernen Sie, wie Sie diese Modelle mit dem Attention-Mechanismus verbessern können - Erfahren Sie, wie generatives Deep Learning Agenten dabei unterstützen kann, Aufgaben im Rahmen des Reinforcement Learning zu erfüllen - Lernen Sie die Architektur von Transformern (BERT, GPT-2) und Bilderzeugungsmodellen wie ProGAN und StyleGAN kennen "Dieses Buch ist eine leicht zugängliche Einführung in das Deep-Learning-Toolkit für generatives Modellieren. Wenn Sie ein kreativer Praktiker sind, der es liebt, an Code zu basteln, und Deep Learning für eigene Aufgaben nutzen möchte, dann ist dieses Buch genau das Richtige für Sie." — David Ha, Research Scientist bei Google Brain

Technologien wie künstliche Intelligenz und Natural Language Programming werden zu Auslösern der sogenannten „Dialogwende“. Darunter versteht dieses Buch die massenweise Verbreitung von autonom sprechenden Sprachdialogsystemen und automatischen Sprachassistenten. Der Autor geht der Frage nach, welche Technologien bereits zur Verfügung stehen oder bald zur Serienreife kommen. Er analysiert konkrete Verwendungen und Einsatzfelder von Bots und stellt sich die Frage, was bei der Planung und Konzeption bedacht werden muss, welche Veränderungen in Medien und Unternehmenskommunikation zu erwarten sind. Das Buch beleuchtet darüber hinaus auch die psychosozialen Folgen, die auf unsere Gesellschaft zukommen, wenn Sprachdialogsysteme in großer Zahl zum Einsatz kommen.

Explore GPU-enabled programmable environment for machine learning, scientific applications, and gaming using PuCUDA, PyOpenGL, and Anaconda Accelerate Key Features Understand effective synchronization strategies for faster processing using GPUs Write parallel processing scripts with PyCuda and PyOpenCL Learn to use the CUDA libraries like CuDNN for deep learning on GPUs Book Description GPUs are proving to be excellent general purpose-parallel computing solutions for high performance tasks such as deep learning and scientific computing. This book will be your guide to getting started with GPU computing. It will start with introducing GPU computing and explain the architecture and programming models for GPUs. You will learn, by example, how to perform GPU programming with Python, and you'll look at using integrations such as PyCUDA, PyOpenCL, CuPy and Numba with Anaconda for various tasks such as machine learning and data mining. Going further, you will get to grips with GPU work flows, management, and deployment using modern containerization solutions. Toward the end of the book, you will get familiar with the principles of distributed computing for training machine learning models and enhancing efficiency and performance. By the end of this book, you will be able to set up a GPU ecosystem for running complex applications and data

models that demand great processing capabilities, and be able to efficiently manage memory to compute your application effectively and quickly. What you will learn Utilize Python libraries and frameworks for GPU acceleration Set up a GPU-enabled programmable machine learning environment on your system with Anaconda Deploy your machine learning system on cloud containers with illustrated examples Explore PyCUDA and PyOpenCL and compare them with platforms such as CUDA, OpenCL and ROCm. Perform data mining tasks with machine learning models on GPUs Extend your knowledge of GPU computing in scientific applications Who this book is for Data Scientist, Machine Learning enthusiasts and professionals who wants to get started with GPU computation and perform the complex tasks with low-latency. Intermediate knowledge of Python programming is assumed.

Delve into neural networks, implement deep learning algorithms, and explore layers of data abstraction with the help of TensorFlow. Key Features Learn how to implement advanced techniques in deep learning with Google's brainchild, TensorFlow Explore deep neural networks and layers of data abstraction with the help of this comprehensive guide Gain real-world contextualization through some deep learning problems concerning research and application Book Description Deep learning is a branch of machine learning algorithms based on learning multiple levels of abstraction. Neural networks, which are at the core of deep learning, are being used in predictive analytics, computer vision, natural language processing, time series forecasting, and to perform a myriad of other complex tasks. This book is conceived for developers, data analysts, machine learning practitioners and deep learning enthusiasts who want to build powerful, robust, and accurate predictive models with the power of TensorFlow, combined with other open source Python libraries. Throughout the book, you'll learn how to develop deep learning applications for machine learning systems using Feedforward Neural Networks, Convolutional Neural Networks, Recurrent Neural Networks, Autoencoders, and Factorization Machines. Discover how to attain deep learning programming on GPU in a distributed way. You'll come away with an in-depth knowledge of machine learning techniques and the skills to apply them to real-world projects. What you will learn Apply deep machine intelligence and GPU computing with TensorFlow Access public datasets and use TensorFlow to load, process, and transform the data Discover how to use the high-level TensorFlow API to build more powerful applications Use deep learning for scalable object detection and mobile computing Train machines quickly to learn from data by exploring reinforcement learning techniques Explore active areas of deep learning research and applications Who this book is for The book is for people interested in machine learning and machine intelligence. A rudimentary level of programming in one language is assumed, as is a basic familiarity with computer science techniques and technologies, including a basic awareness of computer hardware and algorithms. Some competence in mathematics is needed to the level of elementary linear algebra and calculus. This book is a step-by-step guide to show you how to implement generative models in TensorFlow 2.x from scratch. You'll get to grips with the image generative technology by covering autoencoders, style transfer, and GANs as well as fundamental and state-of-the-art models.

Create Deep Learning and Reinforcement Learning apps for multiple platforms with TensorFlow Key Features Build TensorFlow-powered AI applications for mobile and embedded devices Learn modern AI topics such as computer vision, NLP, and deep reinforcement learning Get practical insights and exclusive working code not available in the TensorFlow documentation Book Description As a developer, you always need to keep an eye out and be ready for what will be trending soon, while also focusing on what's trending currently. So, what's better than learning about the integration of the best of both worlds, the present and the future? Artificial Intelligence (AI) is widely regarded as the next big thing after mobile, and Google's TensorFlow is the leading open source machine learning framework, the hottest branch of AI. This book covers more than 10 complete iOS, Android, and Raspberry Pi apps powered by TensorFlow and built from scratch, running all kinds of cool TensorFlow models offline on-device: from computer vision, speech and language processing to generative adversarial networks and AlphaZero-like deep reinforcement learning. You'll learn how to use or retrain existing TensorFlow models, build your own models, and develop intelligent mobile apps running those TensorFlow models. You'll learn how to quickly build such apps with step-by-step tutorials and how to avoid many pitfalls in the process with lots of hard-earned troubleshooting tips. What you will learn Classify images with transfer learning Detect objects and their locations Transform pictures with amazing art styles Understand simple speech commands Describe images in natural language Recognize drawing with Convolutional Neural Network and Long Short-Term Memory Predict stock price with Recurrent Neural Network in TensorFlow and Keras Generate and enhance images with generative adversarial networks Build AlphaZero-like mobile game app in TensorFlow and Keras Use TensorFlow Lite and Core ML on mobile Develop TensorFlow apps on Raspberry Pi that can move, see, listen, speak, and learn Who this book is for If you're an iOS/Android developer interested in building and retraining others' TensorFlow models and running them in your mobile apps, or if you're a TensorFlow developer and want to run your new and amazing TensorFlow models on mobile devices, this book is for you. You'll also benefit from this book if you're interested in TensorFlow Lite, Core ML, or TensorFlow on Raspberry Pi.

The purpose of this book is two-fold, we focus on detailed coverage of deep learning and transfer learning, comparing and contrasting the two with easy-to-follow concepts and examples. The second area of focus is on real-world examples and research problems using TensorFlow, Keras and Python ecosystem with hands-on examples.

Deep Learning ist ein Teilbereich des Machine Learning und basiert auf künstlichen neuronalen Netzen. Dieser praktische Leitfaden bietet einen schnellen Einstieg in die Schlüsseltechnologie und erschließt Grundlagen und Arbeitsweisen von Deep Learning. Anhand Python-basierter Beispielanwendungen wird der Umgang mit den Frameworks Caffe/Caffe2 und TensorFlow gezeigt. Einfache, alltagstaugliche Beispiele laden zum Nachprogrammieren ein. Darüber hinaus erfahren Sie, warum moderne Grafikkarten, Big Data und Cloud Computing beim Deep Learning so wichtig sind. Wenn Sie bereits mit Python, NumPy und matplotlib arbeiten, ermöglicht Ihnen dieses Buch, praktische Erfahrungen mit Deep-Learning-Anwendungen zu machen. Deep Learning – die Hintergründe - Lernmethoden, die Deep Learning zugrunde liegen - Aktuelle Anwendungsfelder wie maschinelle Übersetzungen, Sprach- und Bilderkennung bei Google, Facebook, IBM oder Amazon Der Werkzeugkasten mit Docker - Der Docker-Container zum Buch: Alle nötigen Tools und Programme sind bereits installiert, damit Sie die Beispiele des Buchs und eigene Deep-Learning-

Anwendungen leicht ausführen können. - Die Arbeitsumgebung kennenlernen: Jupyter Notebook, Beispieldatensätze, Web Scraping Der Praxiseinstieg - Einführung in Caffè/Caffè2 und TensorFlow - Deep-Learning-Anwendungen nachprogrammieren: Handschrifterkennung, Bilderkennung und -klassifizierung, Deep Dreaming - Lösungen für Big-Data-Szenarien: verteilte Anwendungen, Spark, Cloud-Systeme - Modelle in produktive Systeme überführen Alle Teilgebiete der KI werden mit dieser Einführung kompakt, leicht verständlich und anwendungsbezogen dargestellt. Hier schreibt jemand, der das Gebiet nicht nur bestens kennt, sondern auch in der Lehre engagiert und erfolgreich vertritt. Von der klassischen Logik über das Schließen mit Unsicherheit und maschinelles Lernen bis hin zu Anwendungen wie Expertensysteme oder lernfähige Roboter. Neben dem umfassenden Einblick in dieses faszinierende Teilgebiet der Informatik gewinnen Sie vertiefte Kenntnisse, z. B. hinsichtlich wichtiger Verfahren zur Repräsentation und Verarbeitung von Wissen. Der Anwendungsbezug steht im Fokus der Darstellung. Viele Übungsaufgaben mit Lösungen sowie strukturierte Verweise auf Literatur und Ressourcen im Web ermöglichen ein effektives und kurzweiliges Selbststudium. Für die 3. Auflage ...

- Einführung in die grundlegenden Konzepte von Machine Learning und Deep Learning • Zahlreiche praktische Anwendungsbeispiele zum Lösen konkreter Aufgabenstellungen: Maschinelles Sehen, Sprachverarbeitung, Bildklassifizierung, Vorhersage von Zeitreihen, Stimmungsanalyse • CNNs, Rekurrente neuronale Netze, generative Modelle wie Variational Autoencoder und Generative-Adversarial-Netze Dieses Buch ist eine praxisorientierte Einführung und erläutert die grundlegenden Konzepte sowie den konkreten Einsatz von Deep Learning. Der Autor verzichtet dabei weitgehend auf mathematische Formeln und legt stattdessen den Fokus auf das Vermitteln der praktischen Anwendung von Machine Learning und Deep Learning. Anhand zahlreicher Beispiele erfahren Sie alles, was Sie benötigen, um Deep Learning zum Lösen konkreter Aufgabenstellungen einzusetzen. Dafür verwendet der Autor die Programmiersprache R und die Deep-Learning-Bibliothek Keras, die das beliebteste und am besten geeignete Tool für den Einstieg in Deep Learning ist. Das Buch besteht aus zwei Teilen: Teil I ist eine allgemeine Einführung in das Deep Learning und erläutert die grundlegenden Zusammenhänge und Begriffe sowie alle erforderlichen Konzepte, die für den Einstieg in Deep Learning und Neuronale Netze wichtig sind. In Teil II erläutert der Autor ausführlich die praktischen Anwendungen des Deep Learnings beim maschinellen Sehen (Computer Vision) und bei der Verarbeitung natürlicher Sprache. Viele der hier vorgestellten Beispiele können Ihnen später als Vorlage zum Lösen von Problemen dienen, die Ihnen in der Praxis des Deep Learnings begegnen werden. Das Buch wendet sich an Leser, die bereits Programmiererfahrung mit R haben und die ins Machine Learning und Deep Learning einsteigen möchten. Für den Einsatz von Keras werden grundlegende R-Kenntnisse vorausgesetzt.

Deep Learning with R introduces deep learning and neural networks using the R programming language. The book builds on the understanding of the theoretical and mathematical constructs and enables the reader to create applications on computer vision, natural language processing and transfer learning. The book starts with an introduction to machine learning and moves on to describe the basic architecture, different activation functions, forward propagation, cross-entropy loss and backward propagation of a simple neural network. It goes on to create different code segments to construct deep neural networks. It discusses in detail the initialization of network parameters, optimization techniques, and some of the common issues surrounding neural networks such as dealing with NaNs and the vanishing/exploding gradient problem. Advanced variants of multilayered perceptrons namely, convolutional neural networks and sequence models are explained, followed by application to different use cases. The book makes extensive use of the Keras and TensorFlow frameworks.

Discover ways to implement various deep learning algorithms by leveraging Python and other technologies Key Features Learn deep learning models through several activities Begin with simple machine learning problems, and finish by building a complex system of your own Teach your machines to see by mastering the technologies required for image recognition Book Description Deep learning is rapidly becoming the most preferred way of solving data problems. This is thanks, in part, to its huge variety of mathematical algorithms and their ability to find patterns that are otherwise invisible to us. Deep Learning from the Basics begins with a fast-paced introduction to deep learning with Python, its definition, characteristics, and applications. You'll learn how to use the Python interpreter and the script files in your applications, and utilize NumPy and Matplotlib in your deep learning models. As you progress through the book, you'll discover backpropagation—an efficient way to calculate the gradients of weight parameters—and study multilayer perceptrons and their limitations, before, finally, implementing a three-layer neural network and calculating multidimensional arrays. By the end of the book, you'll have the knowledge to apply the relevant technologies in deep learning. What you will learn Use Python with minimum external sources to implement deep learning programs Study the various deep learning and neural network theories Learn how to determine learning coefficients and the initial values of weights Implement trends such as Batch Normalization, Dropout, and Adam Explore applications like automatic driving, image generation, and reinforcement learning Who this book is for Deep Learning from the Basics is designed for data scientists, data analysts, and developers who want to use deep learning techniques to develop efficient solutions. This book is ideal for those who want a deeper understanding as well as an overview of the technologies. Some working knowledge of Python is a must. Knowledge of NumPy and pandas will be beneficial, but not essential.

Hermeneutik fundiert als nicht-methodisierbare Methode der Geisteswissenschaften zugleich deren Selbstverständnis und strittigen Status als Wissenschaft. Die Arbeit unternimmt eine kritische Betrachtung der Grenzen bzw. der Möglichkeit eines sinnverstehenden, interpretierenden Zugangs zu Texten durch maschinelle Algorithmen. Dieses Vorhaben motiviert sich einerseits aus den Erwartungshaltungen, die an moderne KI-Technologien gerichtet werden, andererseits aus der Emphase, mit der im Hinblick auf KI-Fortschritte reagiert wird - und richtet sich damit gegen Mystifikationen insbesondere angesichts von Machine-Learning-Technologien, ohne aber hermeneutisches

Sinnverstehen als einem formalen Zugriff von vornherein entzogen anzunehmen.

How can machine learning--especially deep neural networks--make a real difference in your organization? This hands-on guide not only provides practical information, but helps you get started building efficient deep learning networks. The authors provide the fundamentals of deep learning--tuning, parallelization, vectorization, and building pipelines--that are valid for any library before introducing the open source Deeplearning4j (DL4J) library for developing production-class workflows. Through real-world examples, you'll learn methods and strategies for training deep network architectures and running deep learning workflows on Spark and Hadoop with DL4J.

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 two-volume set LNCS 12794-12795 constitutes the refereed proceedings of the 9th International Conference on Culture and Computing, C&C 2021, which was held as part of HCI International 2021 and took place virtually during July 24-29, 2021. The total of 1276 papers and 241 poster papers included in the 39 HCII 2020 proceedings volumes was carefully reviewed and selected from 5222 submissions. The papers included in the HCII-C&C volume set were organized in topical sections as follows: Part I: ICT for cultural heritage; technology and art; visitors' experiences in digital culture; Part II: Design thinking in cultural contexts; digital humanities, new media and culture; perspectives on cultural computing.

Master the essential skills needed to recognize and solve complex problems with machine learning and deep learning. Using real-world examples that leverage the popular Python machine learning ecosystem, this book is your perfect companion for learning the art and science of machine learning to become a successful practitioner. The concepts, techniques, tools, frameworks, and methodologies used in this book will teach you how to think, design, build, and execute machine learning systems and projects successfully. Practical Machine Learning with Python follows a structured and comprehensive three-tiered approach packed with hands-on examples and code. Part 1 focuses on understanding machine learning concepts and tools. This includes machine learning basics with a broad overview of algorithms, techniques, concepts and applications, followed by a tour of the entire Python machine learning ecosystem. Brief guides for useful machine learning tools, libraries and frameworks are also covered. Part 2 details standard machine learning pipelines, with an emphasis on data processing analysis, feature engineering, and modeling. You will learn how to process, wrangle, summarize and visualize data in its various forms. Feature engineering and selection methodologies will be covered in detail with real-world datasets followed by model building, tuning, interpretation and deployment. Part 3 explores multiple real-world case studies spanning diverse domains and industries like retail, transportation, movies, music, marketing, computer vision and finance. For each case study, you will learn the application of various machine learning techniques and methods. The hands-on examples will help you become familiar with state-of-the-art machine learning tools and techniques and understand what algorithms are best suited for any problem. Practical Machine Learning with Python will empower you to start solving your own problems with machine learning today! What You'll Learn Execute end-to-end machine learning projects and systems Implement hands-on examples with industry standard, open source, robust machine learning tools and frameworks Review case studies depicting applications of machine learning and deep learning on diverse domains and industries Apply a wide range of machine learning models including regression, classification, and clustering. Understand and apply the latest models and methodologies from deep learning including CNNs, RNNs, LSTMs and transfer learning. Who This Book Is For IT professionals, analysts, developers, data scientists, engineers, graduate students

With the reinvigoration of neural networks in the 2000s, deep learning has become an extremely active area of research, one that's paving the way for modern machine learning. In this practical book, author Nikhil Buduma provides examples and clear explanations to guide you through major concepts of this complicated field. Companies such as Google, Microsoft, and Facebook are actively growing in-house deep-learning teams. For the rest of us, however, deep learning is still a pretty complex and difficult subject to grasp. If you're familiar with Python, and have a background in calculus, along with a basic understanding of machine learning, this book will get you started. Examine the foundations of machine learning and neural networks Learn how to train feed-forward neural networks Use TensorFlow to implement your first neural network Manage problems that arise as you begin to make networks deeper Build neural networks that analyze complex images Perform effective dimensionality reduction using autoencoders Dive deep into sequence analysis to examine language Learn the fundamentals of reinforcement learning This comprehensive reference text discusses the fundamental concepts of artificial intelligence and its applications in a single volume. Artificial Intelligence: Fundamentals and Applications presents a detailed discussion of basic aspects and ethics in the

field of artificial intelligence and its applications in areas, including electronic devices and systems, consumer electronics, automobile engineering, manufacturing, robotics and automation, agriculture, banking, and predictive analysis. Aimed at senior undergraduate and graduate students in the field of electrical engineering, electronics engineering, manufacturing engineering, pharmacy, and healthcare, this text: Discusses advances in artificial intelligence and its applications. Presents the predictive analysis and data analysis using artificial intelligence. Covers the algorithms and pseudo-codes for different domains. Discusses the latest development of artificial intelligence in the field of practical speech recognition, machine translation, autonomous vehicles, and household robotics. Covers the applications of artificial intelligence in fields, including pharmacy and healthcare, electronic devices and systems, manufacturing, consumer electronics, and robotics.

Bildverarbeitung spielt in vielen Bereichen der Technik zur schnellen und berührungslosen Datenerfassung eine Schlüsselrolle, etwa in der Qualitätssicherung oder in der Robotik. Der vorliegende Tagungsband des „Forums Bildverarbeitung“, das am 26. und 27.11.2020 in Karlsruhe als gemeinsame Veranstaltung des Karlsruher Instituts für Technologie und des Fraunhofer-Instituts für Optronik, Systemtechnik und Bildauswertung stattfand, enthält die Aufsätze der Beiträge. - Image processing plays a key role for fast and contact-free data acquisition in many technical areas, e.g., in quality control or robotics. These conference proceedings of the “Forum Bildverarbeitung”, which took place on 26.-27.11.202 in Karlsruhe as a common event of the Karlsruhe Institute of Technology and the Fraunhofer Institute of Optronics, System Technologies and Image Exploitation, contain the articles of the contributions.

Learn the skills necessary to design, build, and deploy applications powered by machine learning (ML). Through the course of this hands-on book, you'll build an example ML-driven application from initial idea to deployed product. Data scientists, software engineers, and product managers—including experienced practitioners and novices alike—will learn the tools, best practices, and challenges involved in building a real-world ML application step by step. Author Emmanuel Ameisen, an experienced data scientist who led an AI education program, demonstrates practical ML concepts using code snippets, illustrations, screenshots, and interviews with industry leaders. Part I teaches you how to plan an ML application and measure success. Part II explains how to build a working ML model. Part III demonstrates ways to improve the model until it fulfills your original vision. Part IV covers deployment and monitoring strategies. This book will help you: Define your product goal and set up a machine learning problem Build your first end-to-end pipeline quickly and acquire an initial dataset Train and evaluate your ML models and address performance bottlenecks Deploy and monitor your models in a production environment

The two volumes LNCS 11935 and 11936 constitute the proceedings of the 9th International Conference on Intelligence Science and Big Data Engineering, IScIDE 2019, held in Nanjing, China, in October 2019. The 84 full papers presented were carefully reviewed and selected from 252 submissions. The papers are organized in two parts: visual data engineering; and big data and machine learning. They cover a large range of topics including information theoretic and Bayesian approaches, probabilistic graphical models, big data analysis, neural networks and neuro-informatics, bioinformatics, computational biology and brain-computer interfaces, as well as advances in fundamental pattern recognition techniques relevant to image processing, computer vision and machine learning.

This book reflects and expands on the current trend in the building industry to understand, simulate and ultimately design buildings by taking into consideration the interlinked elements and forces that act on them. Shifting away from the traditional focus, which was exclusively on building tasks, this approach presents new challenges in all areas of the industry, from material and structural to the urban scale. The book presents contributions including research papers and case studies, providing a comprehensive overview of the field as well as perspectives from related disciplines, such as computer science. The chapter authors were invited speakers at the 7th Symposium “Impact: Design With All Senses”, which took place at the University of the Arts in Berlin in September 2019.

A Temporally Coherent Neural Algorithm for Artistic Style Transfer

With technology creating a more competitive market, the global economy has been continually evolving in recent years. These technological developments have drastically changed the ways organizations manage their resources, as they are constantly seeking innovative methods to implement new systems. Because of this, there is an urgent need for empirical research that studies advancing theories and applications that organizations can use to successfully handle information and supplies. Novel Theories and Applications of Global Information Resource Management is a pivotal reference source that provides vital research on developing practices for businesses to effectively manage their assets on a global scale. While highlighting topics such as enterprise systems, library management, and information security, this publication explores the implementation of technological innovation into business techniques as well as the methods of controlling information in a contemporary society. This book is ideally designed for brokers, accountants, marketers, researchers, data scientists, financiers, managers, and academicians seeking current research on global resource management.

An authority on creativity introduces us to AI-powered computers that are creating art, literature, and music that may well surpass the creations of humans. Today's computers are composing music that sounds “more Bach than Bach,” turning photographs into paintings in the style of Van Gogh's *Starry Night*, and even writing screenplays. But are computers truly creative—or are they merely tools to be used by musicians, artists, and writers? In this book, Arthur I. Miller takes us on a tour of creativity in the age of machines. Miller, an authority on creativity, identifies the key factors essential to the creative process, from “the need for introspection” to “the ability to discover the key problem.” He talks to people on the cutting edge of artificial intelligence, encountering computers that mimic the brain and machines that have defeated champions in chess, *Jeopardy!*, and *Go*. In the central part of the book, Miller explores the riches of computer-created art, introducing us to artists and computer scientists who have, among much else, unleashed an artificial neural network to create a nightmarish, multi-eyed dog-cat; taught AI to imagine; developed a robot that paints; created algorithms for poetry; and produced the world's first computer-composed musical, *Beyond the Fence*, staged by Android Lloyd Webber and friends. But, Miller writes, in order to be truly creative, machines will need to step into the world. He probes the nature of consciousness and speaks to researchers trying to develop emotions and consciousness in computers. Miller argues that computers can already be as creative as humans—and someday will surpass us. But this is not a dystopian

