Robotics Everything You Need To Know About Robotics From Beginner To Expert Robotics 101 Robotics Mastery

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Living with Robots - Ruth Aylett 2021-09-21
The truth about robots: two experts look beyond the hype, offering a lively and accessible guide to what robots can (and can't) do. There's a lot of hype about robots; some of it is scary and some of it utopian. In this accessible book, two robotics experts reveal the truth about what robots can and can't do, how they work, and what we can reasonably expect their future capabilities to be. It will not only make you think differently about the capabilities of robots; it will make you think differently about the capabilities of humans. Ruth Aylett and Patricia Vargas discuss the history of our fascination with robots—from chatbots and prosthetics to autonomous cars and robot swarms. They show us the ways in which robots outperform humans and the ways they fall woefully short of our superior talents. They explain how robots see, feel, hear, think, and learn; describe how robots can cooperate; and consider robots as pets, butlers, and companions. Finally, they look at robots that raise ethical and social issues: killer robots, sexbots, and robots that might be gunning for your job. Living with Robots equips

readers to look at robots concretely—as human-made artifacts rather than placeholders for our anxieties. Find out: •Why robots can swim and fly but find it difficult to walk •Which robot features are inspired by animals and insects •Why we develop feelings for robots •Which human abilities are hard for robots to emulate
Practical Robotics in C++ - Lloyd Brombach 2021-01-29
An easy-to-follow guide that will help you build robots using with ease KEY FEATURES ● Simplified coverage on fundamentals of building a robot platform. ● Learn to program Raspberry Pi for interacting with hardware. ● Cutting-edge coverage on autonomous motion, mapping, and path planning algorithms for advanced robotics. DESCRIPTION Practical Robotics in C++ teaches the complete spectrum of Robotics, right from the setting up a computer for a robot controller to putting power to the wheel motors. The book brings you the workshop knowledge of the electronics, hardware, and software for building a mobile robot platform. You will learn how to use sensors to detect obstacles, how to train your robot to build itself a map and plan an

obstacle-avoiding path, and how to structure your code for modularity and interchangeability with other robot projects. Throughout the book, you can experience the demonstrations of complete coding of robotics with the use of simple and clear C++ programming. In addition, you will explore how to leverage the Raspberry Pi GPIO hardware interface pins and existing libraries to make an incredibly capable machine on the most affordable computer platform ever. WHAT YOU WILL LEARN ● Write code for the motor drive controller. ● Build a Map from Lidar Data. ● Write and implement your own autonomous path-planning algorithm. ● Write code to send path waypoints to the motor drive controller autonomously. ● Get to know more about robot mapping and navigation. WHO THIS BOOK IS FOR This book is most suitable for C++ programmers who have keen interest in robotics and hardware programming. All you need is just a good understanding of C++ programming to get the most out of this book. TABLE OF CONTENTS 1. Choose and Set Up a Robot Computer 2. GPIO Hardware Interface Pins Overview and Use 3. The Robot Platform 4. Types of Robot Motors and Motor Control 5. Communication with Sensors and other Devices 6. Additional Helpful Hardware 7. Adding the Computer to Control your Robot 8. Robot Control Strategy 9. Coordinating the Parts 10. Maps for Robot Navigation 11. Robot Tracking and Localization 12. Autonomous Motion 13. Autonomous Path Planning 14. Wheel Encoders for Odometry 15. Ultrasonic Range Detectors 16. IMUs: Accelerometers, Gyroscopes, and Magnetometers 17. GPS and External Beacon Systems 18. LIDAR Devices and Data 19. Real Vision with Cameras 20. Sensor Fusion 21. Building and Programming an Autonomous Robot

Robot Programming - Cameron Hughes 2016-05-02
Start programming robots NOW! Learn hands-on, through easy examples, visuals, and code This is a unique introduction to programming robots to execute tasks autonomously. Drawing on years of experience in artificial intelligence and robot programming, Cameron and Tracey Hughes introduce the reader to basic concepts of programming robots to execute tasks without the use of remote controls. Robot Programming:

A Guide to Controlling Autonomous Robots takes the reader on an adventure through the eyes of Midamba, a lad who has been stranded on a desert island and must find a way to program robots to help him escape. In this guide, you are presented with practical approaches and techniques to program robot sensors, motors, and translate your ideas into tasks a robot can execute autonomously. These techniques can be used on today's leading robot microcontrollers (ARM9 and ARM7) and robot platforms (including the wildly popular low-cost Arduino platforms, LEGO® Mindstorms EV3, NXT, and Wowee RS Media Robot) for your hardware/Maker/DIY projects. Along the way the reader will learn how to: Program robot sensors and motors Program a robot arm to perform a task Describe the robot's tasks and environments in a way that a robot can process using robot S.T.O.R.I.E.S. Develop a R.S.V.P. (Robot Scenario Visual Planning) used for designing the robot's tasks in an environment Program a robot to deal with the "unexpected" using robot S.P.A.C.E.S. Program robots safely using S.A.R.A.A. (Safe Autonomous Robot Application Architecture) Approach Program robots using Arduino C/C++ and Java languages Use robot programming techniques with LEGO® Mindstorms EV3, Arduino, and other ARM7 and ARM9-based robots.

Robotics Through Science Fiction - Robin R. Murphy 2018-12-25
Six classic science fiction stories and commentary that illustrate and explain key algorithms or principles of artificial intelligence. This book presents six classic science fiction stories and commentary that illustrate and explain key algorithms or principles of artificial intelligence. Even though all the stories were originally published before 1973, they help readers grapple with two questions that stir debate even today: how are intelligent robots programmed? and what are the limits of autonomous robots? The stories—by Isaac Asimov, Vernor Vinge, Brian Aldiss, and Philip K. Dick—cover telepresence, behavior-based robotics, deliberation, testing, human-robot interaction, the "uncanny valley," natural language understanding, machine learning, and ethics. Each story is preceded by an introductory note, "As You Read the Story," and followed by a

discussion of its implications, "After You Have Read the Story." Together with the commentary, the stories offer a nontechnical introduction to robotics. The stories can also be considered as a set of—admittedly fanciful—case studies to be read in conjunction with more serious study. Contents "Stranger in Paradise" by Isaac Asimov, 1973 "Runaround" by Isaac Asimov, 1942 "Long Shot" by Vernor Vinge, 1972 "Catch That Rabbit" by Isaac Asimov, 1944 "Super-Toys Last All Summer Long" by Brian Aldiss, 1969 "Second Variety" by Philip K. Dick, 1953

Elements of Robotics - Mordechai Ben-Ari 2017-10-25
This open access book bridges the gap between playing with robots in school and studying robotics at the upper undergraduate and graduate levels to prepare for careers in industry and research. Robotic algorithms are presented formally, but using only mathematics known by high-school and first-year college students, such as calculus, matrices and probability. Concepts and algorithms are explained through detailed diagrams and calculations. Elements of Robotics presents an overview of different types of robots and the components used to build robots, but focuses on robotic algorithms: simple algorithms like odometry and feedback control, as well as algorithms for advanced topics like localization, mapping, image processing, machine learning and swarm robotics. These algorithms are demonstrated in simplified contexts that enable detailed computations to be performed and feasible activities to be posed. Students who study these simplified demonstrations will be well prepared for advanced study of robotics. The algorithms are presented at a relatively abstract level, not tied to any specific robot. Instead a generic robot is defined that uses elements common to most educational robots: differential drive with two motors, proximity sensors and some method of displaying output to the user. The theory is supplemented with over 100 activities, most of which can be successfully implemented using inexpensive educational robots. Activities that require more computation can be programmed on a computer. Archives are available with suggested implementations for the Thymio robot and standalone programs in Python.

Learn Robotics with Raspberry Pi - Matt Timmons-Brown 2019-01-22
In Learn Robotics with Raspberry Pi, you'll learn how to build and code your own robot projects with just the Raspberry Pi microcomputer and a few easy-to-get components - no prior experience necessary! Learn Robotics with Raspberry Pi will take you from inexperienced maker to robot builder. You'll start off building a two-wheeled robot powered by a Raspberry Pi minicomputer and then program it using Python, the world's most popular programming language. Gradually, you'll improve your robot by adding increasingly advanced functionality until it can follow lines, avoid obstacles, and even recognize objects of a certain size and color using computer vision. Learn how to: - Control your robot remotely using only a Wii remote - Teach your robot to use sensors to avoid obstacles - Program your robot to follow a line autonomously - Customize your robot with LEDs and speakers to make it light up and play sounds - See what your robot sees with a Pi Camera As you work through the book, you'll learn fundamental electronics skills like how to wire up parts, use resistors and regulators, and determine how much power your robot needs. By the end, you'll have learned the basics of coding in Python and know enough about working with hardware like LEDs, motors, and sensors to expand your creations beyond simple robots.

Running with Robots - Greg Toppo 2021-09-28
How the technological changes that are reshaping the future of work will transform the American high school as well. What will high school education look like in twenty years? High school students are educated today to take their places in a knowledge economy. But the knowledge economy, based on the assumption that information is a scarce and precious commodity, is giving way to an economy in which information is ubiquitous, digital, and machine-generated. In Running with Robots, Greg Toppo and Jim Tracy show how the technological advances that are already changing the world of work will transform the American high school as well. Toppo and Tracy-- a journalist and an education leader, respectively--look at developments in artificial intelligence and other fields that promise to

bring us not only driverless cars but doctorless patients, lawyerless clients, and possibly even teacherless students. They visit schools from New York City to Iowa that have begun preparing for this new world. Toppo and Tracy intersperse these reports from the present with bulletins from the future, telling the story of a high school principal who, Rip Van Winkle-style, sleeps for twenty years and, upon awakening in 2040, can hardly believe his eyes: the principal's amazingly efficient assistant is a robot, calculation is outsourced to computers, and students, grouped by competence and not grade level, focus on the conceptual. The lesson to be learned from both the present and the book's thought-experiment future: human and robotic skillsets are complementary, not in competition. We can run with robots, not against them.

Space Robotics - Yaobing Wang 2020-09-10
This book provides readers with basic concepts and design theories for space robots and presents essential methodologies for implementing space robot engineering by introducing several concrete projects as illustrative examples. Readers will gain a comprehensive understanding of professional theories in the field of space robots, and will find an initial introduction to the engineering processes involved in developing space robots. Rapid advances in technologies such as the Internet of Things, Cloud Computing, and Artificial Intelligence have also produced profound changes in space robots. With the continuous expansion of human exploration of the universe, it is imperative for space robots to be capable of sharing knowledge, working collaboratively, and becoming more and more intelligent so as to optimize the utilization of space resources. For on-orbit robots that perform service tasks such as spacecraft assembly and maintenance, as well as exploration robots that carry out research tasks on planetary surfaces, the rational integration into a network system can greatly improve their capabilities in connection with executing outer space tasks, such as information gathering and utilization, independent decision-making and planning, risk avoidance, and reliability, while also significantly reducing resource consumption for the system as a whole.

Robotics Engineering - Ed Sobey 2017-09-15

Have you always been fascinated with robots? Do you want to know how to build one yourself? Learn the basics from a real-life expert and get some hands-on experience. The world of robotics engineering is at your fingertips.

Modern Robotics - Kevin M. Lynch 2017-05-25
This introduction to robotics offers a distinct and unified perspective of the mechanics, planning and control of robots. Ideal for self-learning, or for courses, as it assumes only freshman-level physics, ordinary differential equations, linear algebra and a little bit of computing background. Modern Robotics presents the state-of-the-art, screw-theoretic techniques capturing the most salient physical features of a robot in an intuitive geometrical way. With numerous exercises at the end of each chapter, accompanying software written to reinforce the concepts in the book and video lectures aimed at changing the classroom experience, this is the go-to textbook for learning about this fascinating subject.

Robot-Proof - Joseph E. Aoun 2018-08-14
How to educate the next generation of college students to invent, to create, and to discover—filling needs that even the most sophisticated robot cannot. Driverless cars are hitting the road, powered by artificial intelligence. Robots can climb stairs, open doors, win Jeopardy, analyze stocks, work in factories, find parking spaces, advise oncologists. In the past, automation was considered a threat to low-skilled labor. Now, many high-skilled functions, including interpreting medical images, doing legal research, and analyzing data, are within the skill sets of machines. How can higher education prepare students for their professional lives when professions themselves are disappearing? In Robot-Proof, Northeastern University president Joseph Aoun proposes a way to educate the next generation of college students to invent, to create, and to discover—to fill needs in society that even the most sophisticated artificial intelligence agent cannot. A "robot-proof" education, Aoun argues, is not concerned solely with topping up students' minds with high-octane facts. Rather, it calibrates them with a creative mindset and the mental elasticity to invent, discover, or create something valuable to society—a scientific proof, a hip-hop recording, a web comic, a cure for cancer. Aoun lays out the framework for a new

discipline, humanics, which builds on our innate strengths and prepares students to compete in a labor market in which smart machines work alongside human professionals. The new literacies of Aoun's humanics are data literacy, technological literacy, and human literacy. Students will need data literacy to manage the flow of big data, and technological literacy to know how their machines work, but human literacy—the humanities, communication, and design—to function as a human being. Life-long learning opportunities will support their ability to adapt to change. The only certainty about the future is change. Higher education based on the new literacies of humanics can equip students for living and working through change.

Learn Robotics Programming - Danny Staple 2021-02-12
Develop an extendable smart robot capable of performing a complex series of actions with Python and Raspberry Pi Key FeaturesGet up to speed with the fundamentals of robotic programming and build intelligent robotsLearn how to program a voice agent to control and interact with your robot's behaviorEnable your robot to see its environment and avoid barriers using sensorsBook Description We live in an age where the most complex or repetitive tasks are automated. Smart robots have the potential to revolutionize how we perform all kinds of tasks with high accuracy and efficiency. With this second edition of Learn Robotics Programming, you'll see how a combination of the Raspberry Pi and Python can be a great starting point for robot programming. The book starts by introducing you to the basic structure of a robot and shows you how to design, build, and program it. As you make your way through the book, you'll add different outputs and sensors, learn robot building skills, and write code to add autonomous behavior using sensors and a camera. You'll also be able to upgrade your robot with Wi-Fi connectivity to control it using a smartphone. Finally, you'll understand how you can apply the skills that you've learned to visualize, lay out, build, and code your future robot building projects. By the end of this book, you'll have built an interesting robot that can perform basic artificial intelligence operations and be well versed in programming robots and creating complex robotics projects using what

you've learned. What you will learnLeverage the features of the Raspberry Pi OSDiscover how to configure a Raspberry Pi to build an AI-enabled robotInterface motors and sensors with a Raspberry PiCode your robot to develop engaging and intelligent robot behaviorExplore AI behavior such as speech recognition and visual processingFind out how you can control AI robots with a mobile phone over Wi-FiUnderstand how to choose the right parts and assemble your robotWho this book is for This second edition of Learn Robotics Programming is for programmers, developers, and robotics enthusiasts who want to develop a fully functional robot and leverage AI to build interactive robots. Basic knowledge of the Python programming language will help you understand the concepts covered in this robot programming book more effectively.

Robotics - Neil Wilkins 2019-12-10
Robotics is slowly creeping into our lives, and soon, robots will be everywhere. Do you know everything there is to know about robotics? Do you want to know more about robotics? Do you want to discover the advantages of robotics? If so, then you've come to the right place.

Effective Robotics Programming with ROS - Anil Mahtani 2016-12-27
Find out everything you need to know to build powerful robots with the most up-to-date ROS About This Book This comprehensive, yet easy-to-follow guide will help you find your way through the ROS framework Successfully design and simulate your 3D robot model and use powerful robotics algorithms and tools to program and set up your robots with an unparalleled experience by using the exciting new features from Robot Kinetic Use the latest version of gazebo simulator, OpenCV 3.0, and C++11 standard for your own algorithms Who This Book Is For This book is suitable for an ROS beginner as well as an experienced ROS roboticist or ROS user or developer who is curious to learn ROS Kinetic and its features to make an autonomous Robot. The book is also suitable for those who want to integrate sensors and embedded systems with other software and tools using ROS as a framework. What You Will Learn Understand the concepts of ROS, the command-line tools, visualization GUIs, and how to debug ROS Connect robot sensors and

actuators to ROS Obtain and analyze data from cameras and 3D sensors Use Gazebo for robot/sensor and environment simulation Design a robot and see how to make it map the environment, navigate autonomously, and manipulate objects in the environment using MoveIt! Add vision capabilities to the robot using OpenCV 3.0 Add 3D perception capabilities to the robot using the latest version of PCL In Detail Building and programming a robot can be cumbersome and time-consuming, but not when you have the right collection of tools, libraries, and more importantly expert collaboration. ROS enables collaborative software development and offers an unmatched simulated environment that simplifies the entire robot building process. This book is packed with hands-on examples that will help you program your robot and give you complete solutions using open source ROS libraries and tools. It also shows you how to use virtual machines and Docker containers to simplify the installation of Ubuntu and the ROS framework, so you can start working in an isolated and control environment without changing your regular computer setup. It starts with the installation and basic concepts, then continues with more complex modules available in ROS such as sensors and actuators integration (drivers), navigation and mapping (so you can create an autonomous mobile robot), manipulation, Computer Vision, perception in 3D with PCL, and more. By the end of the book, you'll be able to leverage all the ROS Kinetic features to build a fully fledged robot for all your needs. Style and approach This book is packed with hands-on examples that will help you program your robot and give you complete solutions using ROS open source libraries and tools. All the robotics concepts and modules are explained and multiple examples are provided so that you can understand them easily.

Robotics - Jerold Morena 2021-03-19
What is a circuit in electrical engineering? Robotics Mechanics Automation Circuit Engineering Definition: Circuit Analysis Basics Robotics Mechanics Automation What are the three types of cryptography? provide you first with all the necessary concepts that you need to learn to make the learning process a whole lot easier. learn the designs and forms of Robotics,

and what's more convenient than getting to know all sides!

Wired for War - P. W. Singer 2009-01-22
"[Singer's] enthusiasm becomes infectious . . . Wired for War is a book of its time: this is strategy for the Facebook generation." —Foreign Affairs "An engrossing picture of a new class of weapon that may revolutionize future wars. . ." —Kirkus Reviews P. W. Singer explores the greatest revolution in military affairs since the atom bomb: the dawn of robotic warfare We are on the cusp of a massive shift in military technology that threatens to make real the stuff of I, Robot and The Terminator. Blending historical evidence with interviews of an amazing cast of characters, Singer shows how technology is changing not just how wars are fought, but also the politics, economics, laws, and the ethics that surround war itself. Travelling from the battlefields of Iraq and Afghanistan to modern-day "skunk works" in the midst of suburbia, Wired for War will tantalise a wide readership, from military buffs to policy wonks to gearheads.

What To Expect When You're Expecting Robots - Laura Major 2020-10-13
The next generation of robots will be truly social, but can we make sure that they play well in the sandbox? Most robots are just tools. They do limited sets of tasks subject to constant human control. But a new type of robot is coming. These machines will operate on their own in busy, unpredictable public spaces. They'll ferry deliveries, manage emergency rooms, even grocery shop. Such systems could be truly collaborative, accomplishing tasks we don't do well without our having to stop and direct them. This makes them social entities, so, as robot designers Laura Major and Julie Shah argue, whether they make our lives better or worse is a matter of whether they know how to behave. What to Expect When You're Expecting Robots offers a vision for how robots can survive in the real world and how they will change our relationship to technology. From teaching them manners, to robot-proofing public spaces, to planning for their mistakes, this book answers every question you didn't know you needed to ask about the robots on the way.

Learning Robotics Using Python - Lentin Joseph 2015-05-27

If you are an engineer, a researcher, or a hobbyist, and you are interested in robotics and want to build your own robot, this book is for you. Readers are assumed to be new to robotics but should have experience with Python.

The Robotics Primer - Maja J. Mataric 2007-08-17
A broadly accessible introduction to robotics that spans the most basic concepts and the most novel applications; for students, teachers, and hobbyists. The Robotics Primer offers a broadly accessible introduction to robotics for students at pre-university and university levels, robot hobbyists, and anyone interested in this burgeoning field. The text takes the reader from the most basic concepts (including perception and movement) to the most novel and sophisticated applications and topics (humanoids, shape-shifting robots, space robotics), with an emphasis on what it takes to create autonomous intelligent robot behavior. The core concepts of robotics are carried through from fundamental definitions to more complex explanations, all presented in an engaging, conversational style that will appeal to readers of different backgrounds. The Robotics Primer covers such topics as the definition of robotics, the history of robotics ("Where do Robots Come From?"), robot components, locomotion, manipulation, sensors, control, control architectures, representation, behavior ("Making Your Robot Behave"), navigation, group robotics, learning, and the future of robotics (and its ethical implications). To encourage further engagement, experimentation, and course and lesson design, The Robotics Primer is accompanied by a free robot programming exercise workbook that implements many of the ideas on the book on iRobot platforms. The Robotics Primer is unique as a principled, pedagogical treatment of the topic that is accessible to a broad audience; the only prerequisites are curiosity and attention. It can be used effectively in an educational setting or more informally for self-instruction. The Robotics Primer is a springboard for readers of all backgrounds—including students taking robotics as an elective outside the major, graduate students preparing to specialize in robotics, and K-12 teachers who bring robotics into their classrooms.

Everything Robotics - Jennifer Swanson 2016
They fix spacecraft, dance, tell jokes, and even clean your carpet! From the tiniest robo-bees to gigantic factory machines, robotics is all around you. This technology isn't just for science-fiction anymore -- it's real and more relevant than ever. With stunning visuals and energetic, impactful design, readers won't stop until they've learned everything there is to know about robotics.

Robotics - Peter McKinnon 2016-01-28
Explore the Fascinating World of Robotics! Do you love robots? Are you fascinated with modern advances in technology? Do you want to know how robots work? If so, you'll be delighted with Robotics: Everything You Need to Know About Robotics from Beginner to Expert. You'll learn the history of robotics, learn the 3 Rules, and meet the very first robots. This book also describes the many essential hardware components of today's robots: - Analog and Digital brains - DC, Servo, and Stepper Motors - Bump Sensors and Light Sensors - and even Robotic Bodywork Would you like to build and program your own robot? You can use Robotics: Everything You Need to Know About Robotics from Beginner to Expert to learn the software basics of RoboCORE and how to create "brains" for creations like the Obstacle Avoiding Robot. You'll also learn which materials to use to build your robot body and which sensors you need to help your new friend perceive the world around it. This book even explains how you can construct an Autonomous Wall Climbing Robot! Don't delay - Start Reading Robotics: Everything You Need to Know About Robotics from Beginner to Expert right away! You'll be so glad you gained this exciting and powerful knowledge!

Robotics for Babies - Chris Ferrie 2019-03-01
Help your future genius become the smartest baby in the room by introducing them to robotics with the next installment of the Baby University board book series! Enjoy these simple explanations of complex ideas for your future genius. The perfect robot baby toy or baby engineering book for parents looking to kick start their baby's learning! Robotics for Babies is a colorful, simple introduction to the technology behind robots. This engineering board book is full of scientific and mathematical information from experts Dr. Sarah Kaiser and Chris Ferrie.

Robotics for Babies is the perfect book to teach complex robotics concepts in a simple, engaging way. It's never too early to become a scientist! Set the children in your life on a lifelong path to learning with the next incredible installment of the Baby University board book series. Other Baby University titles include: Quantum Physics for Babies Rocket Science for Babies and many more!

Learn Robotics Programming - Danny Staple 2018-11-29
Gain experience of building a next-generation collaboration robot Key Features Get up and running with the fundamentals of robotic programming Program a robot using Python and the Raspberry Pi 3 Learn to build a smart robot with interactive and AI-enabled behaviors Book Description We live in an age where the most difficult human tasks are now automated. Smart and intelligent robots, which will perform different tasks precisely and efficiently, are the requirement of the hour. A combination of Raspberry Pi and Python works perfectly when making these kinds of robots. Learn Robotics Programming starts by introducing you to the basic structure of a robot, along with how to plan, build, and program it. As you make your way through the book, you will gradually progress to adding different outputs and sensors, learning new building skills, and writing code for interesting behaviors with sensors. You'll also be able to update your robot, and set up web, phone, and Wi-Fi connectivity in order to control it. By the end of the book, you will have built a clever robot that can perform basic artificial intelligence (AI) operations. What you will learn Configure a Raspberry Pi for use in a robot Interface motors and sensors with a Raspberry Pi Implement code to make interesting and intelligent robot behaviors Understand the first steps in AI behavior such as speech recognition visual processing Control AI robots using Wi-Fi Plan the budget for requirements of robots while choosing parts Who this book is for Learn Robotics Programming is for programmers, developers, and enthusiasts interested in robotics and developing a fully functional robot. No major experience required just some programming knowledge would be sufficient.

Artificial Intelligence - Neil Wilkins 2019-12-12

This book covers everything from machine learning to robotics and the internet of things. By the time you finish reading, you will be aware of what artificial neural networks are, how gradient descent and back propagation work, and what deep learning is.

Beginner's Guide to Robotics - Ava Mola Ph D 2019-12-18
Explore the Fascinating World of Robotics! Do you love robots? Are you fascinated with modern advances in technology? Do you want to know how robots work? If so, you'll be delighted with Robotics: Everything You Need to Know About Robotics from Beginner to Expert. You'll learn the history of robotics, learn the 3 Rules, and meet the very first robots. This book also describes the many essential hardware components of today's robots: - Analog and Digital brains - DC, Servo, and Stepper Motors - Bump Sensors and Light Sensors - and even Robotic Bodywork Would you like to build and program your own robot? You can use Robotics: Everything You Need to Know About Robotics from Beginner to Expert to learn the software basics of RoboCORE and how to create "brains" for creations like the Obstacle Avoiding Robot. You'll also learn which materials to use to build your robot body and which sensors you need to help your new friend perceive the world around it. This book even explains how you can construct an Autonomous Wall Climbing Robot! Don't delay - Start Reading Robotics: Everything You Need to Know About Robotics from Beginner to Expert right away! You'll be so glad you gained this exciting and powerful knowledge!

Industrial robots and cobots - Michał Gurgul 2018-12-08
In the modern world, highly repetitive and tiresome tasks are being delegated to machines. The demand for industrial robots is growing not only because of the need to improve production efficiency and the quality of the end products, but also due to rising employment costs and a shortage of skilled professionals. The industrial robot market is projected to grow by 16% year-on-year in the immediate future. The industry's progressing automation is increasing the demand for specialists who can operate robots. If you would like to join this sought-after and well-paid professional group, it's time to learn

how to operate and program robots using modern methods. This book provides all the information you will need to enter the industry without spending money on training or looking for someone willing to introduce you to the world of robotics. You will learn about all aspects of programming and implementing robots in a company. The book consists of four parts: general introduction to robotics for non-technical people; part two describes industry robotisation; part three depicts the principles and methods of programming robots; the final part touches upon the safety of industrial robots and cobots. Are you a student of a technical faculty, or even a manager of a plant who would like to robotise production? If you are interested in this subject, you won't find a better book!

Robotics: A Very Short Introduction - Alan Winfield 2012-09-27
Robotics is a key technology in the modern world. Robots are a well-established part of manufacturing and warehouse automation, assembling cars or washing machines, and, for example, moving goods to and from storage racks for Internet mail order. More recently robots have taken their first steps into homes and hospitals, and seen spectacular success in planetary exploration. Yet, despite these successes, robots have failed to live up to the predictions of the 1950s and 60s, when it was widely thought - by scientists and engineers as well as the public - that by turn of the 21st century we would have intelligent robots as butlers, companions, or co-workers. This Very Short Introduction explains how it is that robotics can be both a success story and a disappointment, how robots can be both ordinary and remarkable, and looks at their important developments in science and their applications to everyday life. ABOUT THE SERIES: The Very Short Introductions series from Oxford University Press contains hundreds of titles in almost every subject area. These pocket-sized books are the perfect way to get ahead in a new subject quickly. Our expert authors combine facts, analysis, perspective, new ideas, and enthusiasm to make interesting and challenging topics highly readable.

New Laws of Robotics - Frank Pasquale 2020-10-27
AI is poised to disrupt our work and our lives. We can harness these technologies rather than fall captive to them—but only through wise regulation. Too many CEOs tell a simple story about the future of work: if a machine can do what you do, your job will be automated. They envision everyone from doctors to soldiers rendered superfluous by ever-more-powerful AI. They offer stark alternatives: make robots or be replaced by them. Another story is possible. In virtually every walk of life, robotic systems can make labor more valuable, not less. Frank Pasquale tells the story of nurses, teachers, designers, and others who partner with technologists, rather than meekly serving as data sources for their computerized replacements. This cooperation reveals the kind of technological advance that could bring us all better health care, education, and more, while maintaining meaningful work. These partnerships also show how law and regulation can promote prosperity for all, rather than a zero-sum race of humans against machines. How far should AI be entrusted to assume tasks once performed by humans? What is gained and lost when it does? What is the optimal mix of robotic and human interaction? New Laws of Robotics makes the case that policymakers must not allow corporations or engineers to answer these questions alone. The kind of automation we get—and who it benefits—will depend on myriad small decisions about how to develop AI. Pasquale proposes ways to democratize that decision making, rather than centralize it in unaccountable firms. Sober yet optimistic, New Laws of Robotics offers an inspiring vision of technological progress, in which human capacities and expertise are the irreplaceable center of an inclusive economy.

The Maker's Guide to Building Robots - Raúl Laperia 2019-04-02
Discover that our lives are surrounded by robots. Learn what they are, where they come from and their importance today as well as meeting some of the most famous robots in history! You see them at the movies and on TV, but you also have them in the kitchen and on your computer. They help us to forecast the weather, they adjust the fridge temperature and they vacuum the dust from our homes in our absence. Robots are everywhere! But we love this invasion. Little by little, these creatures have almost become our

best friends. That's why you need to get to know them well, to know how they work and what their use is. You will find all this and much more in this book. In addition, you will learn how to build your own robot. That's a good plan, right? Quick! Find your favorite seat, get yourself comfy, open this book, and say hello to our robots!

LEGO Technic Robotics - Mark Rollins
2013-03-25
Provides information on using the LEGO Technic robot kit, including how to build a robot body, using the power functions, enabling a robot to walk.

Probabilistic Robotics - Sebastian Thrun
2005-08-19
An introduction to the techniques and algorithms of the newest field in robotics. Probabilistic robotics is a new and growing area in robotics, concerned with perception and control in the face of uncertainty. Building on the field of mathematical statistics, probabilistic robotics endows robots with a new level of robustness in real-world situations. This book introduces the reader to a wealth of techniques and algorithms in the field. All algorithms are based on a single overarching mathematical foundation. Each chapter provides example implementations in pseudo code, detailed mathematical derivations, discussions from a practitioner's perspective, and extensive lists of exercises and class projects. The book's Web site, www.probabilistic-robotics.org, has additional material. The book is relevant for anyone involved in robotic software development and scientific research. It will also be of interest to applied statisticians and engineers dealing with real-world sensor data.

Homemade Robots - Randy Sarafan
2021-08-10
Homemade Robots teaches total beginners how to quickly and easily build 10 mobile, autonomous bots with simple tools and common household materials. A Perfect DIY STEAM adventure for the electronically curious. Homemade Robots is a beginner's guide to building a wide range of mobile, autonomous bots using common household materials. Its 10 creative and easy-to-follow projects are designed to maximize fun with minimal effort—no electronics experience necessary! From the teetering Wobbler to the rolling Barreller, each bot is self-driving and has a unique personality. There's the aptly named Inchworm Bot made of aluminum rulers; Buffer, a street sweeper-like bot that polishes the floor as it walks; and Sail Bot, which changes direction based on the wind. Randy Sarafan's hacker approach to sculptural robotics will appeal to builders of all ages. You'll learn basic electronics, get comfortable with tools and mechanical systems, and gain the confidence to explore further on your own. A wide world of robots is yours to discover, and Homemade Robots is the perfect starting point.

The Future of Work - Darrell M. West
2018-05-15
Looking for ways to handle the transition to a digital economy Robots, artificial intelligence, and driverless cars are no longer things of the distant future. They are with us today and will become increasingly common in coming years, along with virtual reality and digital personal assistants. As these tools advance deeper into everyday use, they raise the question—how will they transform society, the economy, and politics? If companies need fewer workers due to automation and robotics, what happens to those who once held those jobs and don't have the skills for new jobs? And since many social benefits are delivered through jobs, how are people outside the workforce for a lengthy period of time going to earn a living and get health care and social benefits? Looking past today's headlines, political scientist and cultural observer Darrell M. West argues that society needs to rethink the concept of jobs, reconfigure the social contract, move toward a system of lifetime learning, and develop a new kind of politics that can deal with economic dislocations. With the U.S. governance system in shambles because of political polarization and hyper-partisanship, dealing creatively with the transition to a fully digital economy will vex political leaders and complicate the adoption of remedies that could ease the transition pain. It is imperative that we make major adjustments in how we think about work and the social contract in order to prevent society from spiraling out of control. This book presents a number of proposals to help people deal with the transition from an industrial to a digital economy. We must broaden the concept of employment to include

volunteering and parenting and pay greater attention to the opportunities for leisure time. New forms of identity will be possible when the "job" no longer defines people's sense of personal meaning, and they engage in a broader range of activities. Workers will need help throughout their lifetimes to acquire new skills and develop new job capabilities. Political reforms will be necessary to reduce polarization and restore civility so there can be open and healthy debate about where responsibility lies for economic well-being. This book is an important contribution to a discussion about tomorrow—one that needs to take place today.

PIC Robotics: A Beginner's Guide to Robotics Projects Using the PIC Micro - John Iovine 2001-12-21
Here's everything the robotics hobbyist needs to harness the power of the PICMicro MCU! In this heavily-illustrated resource, author John Iovine provides plans and complete parts lists for 11 easy-to-build robots each with a PICMicro "brain." The expertly written coverage of the PIC Basic Computer makes programming a snap -- and lots of fun.

JavaScript Robotics - Backstop Media 2015-04-13
JavaScript Robotics is on the rise. Rick Waldron, the lead author of this book and creator of the Johnny-Five platform, is at the forefront of this movement. Johnny-Five is an open source JavaScript Arduino programming framework for robotics. This book brings together fifteen innovative programmers, each creating a unique Johnny-Five robot step-by-step, and offering tips and tricks along the way. Experience with JavaScript is a prerequisite.

Tales from a Robotic World - Dario Floreano 2022-09-27
Stories from the future of intelligent machines—from rescue drones to robot spouses—and accounts of cutting-edge research that could make it all possible. Tech prognosticators promised us robots—autonomous humanoids that could carry out any number of tasks. Instead, we have robot vacuum cleaners. But, as Dario Floreano and Nicola Nosengo report, advances in robotics could bring those rosy predictions closer to reality. A new generation of robots, directly inspired by the intelligence and bodies of living organisms, will be able not only to process data but to interact physically with humans and the environment. In this book, Floreano, a roboticist, and Nosengo, a science writer, bring us tales from the future of intelligent machines—from rescue drones to robot spouses—along with accounts of the cutting-edge research that could make it all possible. These stories from the not-so-distant future show us robots that can be used for mitigating effects of climate change, providing healthcare, working with humans on the factory floor, and more. Floreano and Nosengo tell us how an application of swarm robotics could protect Venice from flooding, how drones could reduce traffic on the congested streets of mega-cities like Hong Kong, and how a "long-term relationship model" robot could supply sex, love, and companionship. After each fictional scenario, they explain the technologies that underlie it, describing advances in such areas as soft robotics, swarm robotics, aerial and mobile robotics, humanoid robots, wearable robots, and even biohybrid robots based on living cells. Robotics technology is no silver bullet for all the world's problems—but it can help us tackle some of the most pressing challenges we face.

Robotics - Bruno Siciliano 2010-08-20
Based on the successful Modelling and Control of Robot Manipulators by Sciavicco and Siciliano (Springer, 2000), Robotics provides the basic know-how on the foundations of robotics: modelling, planning and control. It has been expanded to include coverage of mobile robots, visual control and motion planning. A variety of problems is raised throughout, and the proper tools to find engineering-oriented solutions are introduced and explained. The text includes coverage of fundamental topics like kinematics, and trajectory planning and related technological aspects including actuators and sensors. To impart practical skill, examples and case studies are carefully worked out and interwoven through the text, with frequent resort to simulation. In addition, end-of-chapter exercises are proposed, and the book is accompanied by an electronic solutions manual containing the MATLAB® code for computer problems; this is available free of charge to those adopting this volume as a textbook for courses.

Introduction to Robotics - Saeed B. Niku 2010-09-22
Niku offers comprehensive, yet concise coverage of robotics that will appeal to engineers. Robotic applications are drawn from a wide variety of fields. Emphasis is placed on design along with analysis and modeling. Kinematics and dynamics are covered extensively in an accessible style. Vision systems are discussed in detail, which is a cutting-edge area in robotics. Engineers will also find a running design project that reinforces the concepts by having them apply what they've learned.

Robotics - Kathy Ceceri 2012-08-01
Once, robots were only found in science fiction books and movies. Today, robots are everywhere! They assemble massive cars and tiny computer chips. They help doctors do delicate surgery. They vacuum our houses and mow our lawns. Robot toys play with us, follow our commands, and respond to our moods. We even send robots to explore the depths of the ocean and the expanse of space. In Robotics, children ages 9 and up learn how robots affect both the future and the present. Hands-on activities make learning both fun and lasting.

Robotics Engineering and Our Automated World - Rebecca Sjonger 2016-08-25
Robots are machines that follow a decision-making process when performing tasks. They are playing an increasing role in manufacturing, agriculture, medicine, mining, and aerospace, as well as in our everyday lives. Readers will learn how robotics engineers find new ways for robots to do work that would be dangerous, time-consuming, dull, or impossible for humans to perform. Real-life examples and a design challenge help students understand key concepts related to the engineering design process, and how robotics engineers play a vital role in expanding our knowledge of the universe.