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5C5 - COLTON MOYER

The Maker's Manual is a practical and comprehensive guide to becoming a hero of the new industrial revolution. It features dozens of color images, techniques to transform your ideas into physical projects, and must-have skills like electronics prototyping, 3d printing, and programming. This book's clear, precise explanations will help you unleash your creativity, make successful projects, and work toward a sustainable maker business. Written by the founders of Frankenstein Garage, which has organized courses since 2011 to help makers to realize their creations, The Maker's Manual answers your questions about the Maker Movement that is revolutionizing the way we design and produce things.

Questo libro raccoglie i 25 anni di esperienza didattica dell'autore e propone un'ampia collezione di esperienze pratiche. Il lettore verrà guidato nelle soluzioni di problemi che spaziano in praticamente tutti i campi dell'elettronica. Qui troverete anche le necessarie basi teoriche in merito alla tecnologia elettronica, lo sviluppo di circuiti stampati con Eagle, una chiara trattazione di elettrotecnica, forti basi per l'uso degli amplificatori operazionali, elettronica digitale anche programmabile, e unico in Italia un'introduzione allo sviluppo dei sistemi SoC, ovvero System on chip. Questi sono sistemi basati sui processori ZYNQ7000 che integrano una potente sezione ARM multicore con una estesa area FPGA della Xilinx. Un'interessante capitolo sulle trasmissioni radio amatoriali stato sviluppato dal dott. Marco Barbisan, post doc presso gli istituti di ricerca del CNR di Padova, amico e collega dell'autore.

Questo libro, edito nel marzo 2018, nasce per estendere e aggiornare l'edizione precedente con lo stesso titolo edito nel 2016. Contiene l'evoluzione verso le nuove piattaforme software e nuove tecnologie delle reti di PLC e TIA Portal V14. Concentra la ventennale esperienza nel campo maturata dall'autore e sostituisce la precedente edizione già molto nota e apprezzata dal pubblico. Una nuova impaginazione e la successione con cui si presentano gli argomenti sono ottimali sia per l'apprendimento scolastico sia per autodidatta portandole conoscenze a livello professionale. Il testo è adatto anche ai corsi universitari di ingegneria. L'impiego di sistemi HMI programmati tramite WinCC integrato in TIA Portal, connessi in Profinet e Profibus completa la preparazione del tecnico. Ogni argomento è corredato di numerosi esercizi. Nella sezione programmazione avanzata si interfaccia un motore asincrono trifase a un inverter. Fondamentale il capitolo sulla normalizzazione dei segnali analogici.

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This book gives an introduction to the programming language Structured Text (ST) which is used in Programmable Logic Controllers (PLC). The book can be used for all types of PLC brands including Siemens Structured Control Language (SCL) and Programmable Automation Controllers (PAC). This 3rd edition has been updated and expanded with many of the suggestions and questions that readers and students have come up with, including the desire for many more illustrations and program examples. CONTENTS: - Background, benefits and challenges of ST programming - Syntax, data types, best practice and basic ST programming - IF-THEN-ELSE, CASE, FOR, CTU, TON, STRUCT, ENUM, ARRAY, STRING - Guide for best practice naming, troubleshooting, test and program structure - Sequencer and code split-up into functions and function blocks - FIFO, RND, sorting, scaling, toggle, simulation signals and digital filter - Tank controls, conveyor belts, adaptive pump algorithm and robot control - PLC program structure for pumping stations, 3D car park and car wash - Examples: From Ladder Diagram to ST programming The book contains more than 150 PLC code examples with a focus on learning how to write robust, readable, and structured code. The book systematically describes basic programming, including advice and practical examples based on the author's extensive industrial experience. The author is Bachelor of Science in Electrical Engineering (B.Sc.E.E.) and has 25 years' experience in specification, development, programming and supplying complex control solutions and supervision systems. The author is Assistant Professor and teaches PLC programming at Dania Academy, a higher education institution in Randers, Denmark.

Quante volte ci siamo innervositi per un modulo difficile da compilare, un applicativo con un manuale lungo e indecifrabile, o con la difficoltà di reperire online informazioni per noi vitali? Quante code per ritirare il referto di un esame o per pagare una multa? Viviamo in un mondo frenetico, perennemente connessi sia sul lavoro che nella vita privata ma, a parte alcuni nativi digitali, molti di noi faticano a beneficiare di questi molteplici canali di comunicazione. Tutti abbiamo in tasca uno smartphone, in grado spesso di farci saltare le code e risparmiare tempo, ma non lo sappiamo nemmeno e il telefono ci serve al massimo per postare su Facebook e per questo farci sentire smart. Un miglior futuro per il nostro Paese passa anche attraverso una maggior consapevolezza del cittadino su cosa desiderare, e in certi casi pretendere dal mondo dei servizi. Ma passa anche da un suo atteggiamento proattivo e collaborativo, per costruire tutti insieme un futuro più semplice. L'autore sogna un mondo dove sia sempre più facile vivere anche grazie all'aiuto del digitale, indipendentemente dalla generazione e dal Paese di cui facciamo parte.

Mobile Robotics: A Practical Introduction (2nd edition) is an excellent introduction to the foundations and methods used for designing completely autonomous mobile robots. A fascinating, cutting-edge,

research topic, autonomous mobile robotics is now taught in more and more universities. In this book you are introduced to the fundamental concepts of this complex field via twelve detailed case studies that show how to build and program real working robots. Topics covered include learning, autonomous navigation in unmodified, noisy and unpredictable environments, and high fidelity robot simulation. This new edition has been updated to include a new chapter on novelty detection, and provides a very practical introduction to mobile robotics for a general scientific audience. It is essential reading for 2nd and 3rd year undergraduate students and postgraduate students studying robotics, artificial intelligence, cognitive science and robot engineering. The update and overview of core concepts in mobile robotics will assist and encourage practitioners of the field and set challenges to explore new avenues of research in this exiting field. The author is Senior Lecturer at the Department of Computer Science at the University of Essex. "A very fine overview over the relevant problems to be solved in the attempt to bring intelligence to a moving vehicle." Professor Dr. Ewald von Puttkamer, University of Kaiserslautern "Case studies show ways of achieving an impressive repertoire of kinds of learned behaviour, navigation and map-building. The book is an admirable introduction to this modern approach to mobile robotics and certainly gives a great deal of food for thought. This is an important and though-provoking book." Alex M. Andrew in *Kybernetes* Vol 29 No 4 and *Robotica* Vol 18

We wanted to write a book that made it easier to learn Siemens Step 7 programming. The book includes a link to download a trial version of Siemens Step 7 (TIA Portal) software. There is a step-by-step appendix on creating a project to ease the learning curve. We wanted the book to be practical, and also have breadth and depth of coverage. There are many practical explanations and examples to illustrate and ease learning. The book covers various models of Siemens PLCs including S7-300, S7-1200, S7-400, and S7-1500. The coverage of project organization provides the basis for a good understanding of programming and project organization. The book covers ladder logic and Function Block Diagram (FBD) programming. Linear and modular programming are covered to provide the basis for an understanding of how an S7 project is organized and how it functions. There is in-depth coverage of ladder logic, timers, counters, math, special instructions, function blocks, and technology objects. Wiring and use of I/O modules for various PLC models is covered. Sinking/sourcing, and the wiring of digital and analog modules are covered. There are also practical examples of the use and application of analog modules and their resolution. There is also a chapter that features a step-by-step coverage on how to create a working HMI application. The setup and application of Technology objects for PID and motion control are also covered. There are extensive questions and exercises for each chapter to guide and aid learning. The book includes answers to selected chapter questions and programming exercises. The book is in color.

This revised and expanded new edition elucidates the elegance and simplicity of the fundamental theory underlying formal languages and compilation. Retaining the reader-friendly style of the 1st edition, this versatile textbook describes the essential principles and methods used for defining the syntax of artificial languages, and for designing efficient parsing algorithms and syntax-directed translators with semantic attributes. Features: presents a novel conceptual approach to parsing algorithms that applies to extended BNF grammars, together with a parallel parsing algorithm (NEW); supplies supplementary teaching tools at an associated website; systematically discusses ambigu-

ous forms, allowing readers to avoid pitfalls; describes all algorithms in pseudocode; makes extensive use of theoretical models of automata, transducers and formal grammars; includes concise coverage of algorithms for processing regular expressions and finite automata; introduces static program analysis based on flow equations.

This handbook provides an overarching view of cyber security and digital forensic challenges related to big data and IoT environment, prior to reviewing existing data mining solutions and their potential application in big data context, and existing authentication and access control for IoT devices. An IoT access control scheme and an IoT forensic framework is also presented in this book, and it explains how the IoT forensic framework can be used to guide investigation of a popular cloud storage service. A distributed file system forensic approach is also presented, which is used to guide the investigation of Ceph. Minecraft, a Massively Multiplayer Online Game, and the Hadoop distributed file system environment are also forensically studied and their findings reported in this book. A forensic IoT source camera identification algorithm is introduced, which uses the camera's sensor pattern noise from the captured image. In addition to the IoT access control and forensic frameworks, this handbook covers a cyber defense triage process for nine advanced persistent threat (APT) groups targeting IoT infrastructure, namely: APT1, Molerats, Silent Chollima, Shell Crew, NetTraveler, ProjectSauron, CopyKittens, Volatile Cedar and Transparent Tribe. The characteristics of remote-controlled real-world Trojans using the Cyber Kill Chain are also examined. It introduces a method to leverage different crashes discovered from two fuzzing approaches, which can be used to enhance the effectiveness of fuzzers. Cloud computing is also often associated with IoT and big data (e.g., cloud-enabled IoT systems), and hence a survey of the cloud security literature and a survey of botnet detection approaches are presented in the book. Finally, game security solutions are studied and explained how one may circumvent such solutions. This handbook targets the security, privacy and forensics research community, and big data research community, including policy makers and government agencies, public and private organizations policy makers. Undergraduate and postgraduate students enrolled in cyber security and forensic programs will also find this handbook useful as a reference.

This book gives an introduction to Structured Text (ST), used in Programmable Logic Control (PLC). The book can be used for all types of PLC brands including Siemens Structured Control Language (SCL) and Programmable Automation Controllers (PAC). Contents: - Background, advantage and challenge when ST programming - Syntax and fundamental ST programming - Widespread guide to reasonable naming of variables - CTU, TOF, TON, CASE, STRUCT, ENUM, ARRAY, STRING - Guide to split-up into program modules and functions - More than 90 PLC code examples in black/white - FIFO, RND, 3D ARRAY and digital filter - Examples: From LADDER to ST programming - Guide to solve programming exercises Many clarifying explanations to the PLC code and focus on the fact that the reader should learn how to write a stable, robust, readable, structured and clear code are also included in the book. Furthermore, the focus is that the reader will be able to write a PLC code, which does not require a specific PLC type and PLC code, which can be reused. The basis of the book is a material which is currently compiled with feedback from lecturers and students attending the AP Education in Automation Engineering at the local Dania Academy, "Erhvervsakademi Dania", Randers, Denmark. The material is thus currently updated so that it answers all the questions which the students typically ask through-out the period of studying. The author is Bachelor of Science in Electrical Engi-

neering (B.Sc.E.E.) and has 25 years of experience within specification, development, programming and supplying complex control solutions and supervision systems. The author is Assistant Professor and teaching PLC control systems at higher educations. LinkedIn: <https://www.linkedin.com/in/tommejerantonsen/>

Get started with the extremely versatile and powerful Arduino Nano 33 BLE Sense, a smart device based on the nRF52840 from Nordic semiconductors. This book introduces you to developing with the device. You'll learn how to access Arduino I/O such as analog and digital I/O, serial communication, SPI and I2C. The book also covers how to access sensor devices on Arduino Nano 33 BLE Sense, how to interact with other external devices over BLE, and build embedded Artificial Intelligence applications. Arduino Nano 33 BLE Sense consists of multiple built-in sensors such as 9-axis inertial, humidity, temperature, barometric, microphone, gesture, proximity, light color and light intensity sensors. With this book, you'll see how this board supports the Bluetooth Low Energy (BLE) network, enabling interactions with other devices over the network. What You'll Learn Prepare and set up Arduino Nano 33 BLE Sense board Operate Arduino Nano 33 BLE Sense board hardware and software Develop programs to access Arduino Nano 33 BLE Sense board I/O Build IoT programs with Arduino Nano 33 BLE Sense board Who This Book Is For Makers, developers, students, and professionals at any level interested in developing with the Arduino Nano 33 BLE Sense board.

In this classic of modern science, the Nobel laureate presents a clear treatment of systems, the First and Second Laws of Thermodynamics, entropy, thermodynamic potentials, and much more. Calculus required.

This book is an introduction to the programming language Ladder Diagram (LD) used in Programmable Logic Controllers (PLC). The book provides a general introduction to PLC controls and can be used for any PLC brands. With a focus on enabling readers without an electrical education to learn Ladder programming, the book is suitable for learners without prior knowledge of Ladder. The book contains numerous illustrations and program examples, based on real-world, practical problems in the field of automation. CONTENTS - Background, benefits and challenges of Ladder programming - PLC hardware, sensors, and basic Ladder programming - Practical guides and tips to achieve good program structures - Theory and examples of flowcharts, block diagrams and sequence diagrams - Design guide to develop functions and function blocks - Examples of organizing code in program modules and functions - Sequencing using SELF-HOLD, SET/RESET and MOVE/COMPARE - Complex code examples for a pump station, tank control and conveyor belt - Design, development, testing and simulation of PLC programs The book describes Ladder programming as described in the standard IEC 61131-3. PLC vendors understand this standard in different ways, and not all vendors follow the standard exactly. This will be clear through material from the vendor. This means that some of the program examples in this book may not work as intended in the PLC type you are using. In addition, there is a difference in how the individual PLC type shows graphic symbols and instructions used in Ladder programming. Note: This is a book for beginners and therefore advanced techniques such as ARRAY, LOOPS, STRUCT, ENUM, STRING, PID and FIFO are not included.

World-renowned economist Klaus Schwab, Founder and Executive Chairman of the World Economic Forum, explains that we have an opportunity to shape the fourth industrial revolution, which will fundamentally alter how we live and work. Schwab argues that this revolution is different in scale,

scope and complexity from any that have come before. Characterized by a range of new technologies that are fusing the physical, digital and biological worlds, the developments are affecting all disciplines, economies, industries and governments, and even challenging ideas about what it means to be human. Artificial intelligence is already all around us, from supercomputers, drones and virtual assistants to 3D printing, DNA sequencing, smart thermostats, wearable sensors and microchips smaller than a grain of sand. But this is just the beginning: nanomaterials 200 times stronger than steel and a million times thinner than a strand of hair and the first transplant of a 3D printed liver are already in development. Imagine "smart factories" in which global systems of manufacturing are coordinated virtually, or implantable mobile phones made of biosynthetic materials. The fourth industrial revolution, says Schwab, is more significant, and its ramifications more profound, than in any prior period of human history. He outlines the key technologies driving this revolution and discusses the major impacts expected on government, business, civil society and individuals. Schwab also offers bold ideas on how to harness these changes and shape a better future—one in which technology empowers people rather than replaces them; progress serves society rather than disrupts it; and in which innovators respect moral and ethical boundaries rather than cross them. We all have the opportunity to contribute to developing new frameworks that advance progress.

Il volume, al momento l'unico in italiano sui PLC S7-1200 e S7-1500, presenta le principali caratteristiche dei due PLC Siemens attualmente in produzione. Nel testo viene prima analizzato l'aspetto hardware e poi, in modo più dettagliato, ma con un linguaggio tecnico sempre accessibile, il software di gestione. La teoria è sviluppata in modo semplice e corredata di esempi che rendono più facile la comprensione. Le tracce degli esercizi sono definibili affini all'impianto. Successivamente vengono espone e sviluppate, sempre con esempi, le principali tecniche di programmazione avanzata. L'opera è divisa in moduli e al termine di ognuno sono proposti un buon numero di domande ed esercizi molto utili per la revisione e il consolidamento dell'argomento sviluppato. Sono presenti anche numerose figure che illustrano l'utilizzo e le funzioni del software TIA Portal.

Libro edito nel 2020 alla quinta edizione aggiornata e ampliata. Basato su TIA Portal V16 mantiene dei cenni anche sulle versioni Siemens precedenti. Contiene 57 esercizi svolti, con molte varianti. Vi sono 15 esercizi proposti ma guidati verso la soluzione. Contiene 4 lavori reali tra cui l'auto apprendimento di una stiratrice automatica, l'impiego di sistemi HMI programmati tramite WinCC connessi in Profinet. Di estrema importanza un parcheggio interrato convertibile in magazzino automatizzato. Un pannello solare a inseguimento con tutte le fasi costruttive. Nella sezione programmazione avanzata si interfaccia un motore trifase a un convertitore statico, inverter, aprendo la strada a tutte le applicazioni reali. Concentra la venticinquennale esperienza nel campo maturata dall'autore. Una nuova impaginazione e la successione con cui si presentano gli argomenti sono ottimali sia per l'apprendimento. Testo unico nel suo genere che va ben oltre la normale didattica sul PLC. dott. ing. PhD Marco Gottardo.

Il volume tratta i PLC S7-1200/1500, caratteristiche hardware, linguaggio LADDER, GRAFCET e SCL. La teoria è sviluppata in modo semplice e corredata di 40 esempi svolti che rendono più facile la comprensione. L'opera è divisa in moduli e al termine è presente un modulo con soli progetti. Sono presenti anche numerose figure che illustrano l'utilizzo e le funzioni del software TIA Portal. per dettagli vai a www.plcs7-1200.it

Android è la piattaforma mobile più diffusa a livello mondiale, con più di un miliardo di device attivati e un ritmo di crescita vertiginoso. Lo scopo di questo libro è illustrare vari ambiti dello sviluppo avanzato di applicazioni Android, con particolare enfasi sulla user interface e sugli aspetti più ingegneristici. Mettendo in pratica le tecniche descritte nel volume il lettore sarà in grado di sviluppare applicazioni in modo professionale, sfruttando appieno il sistema operativo e le principali librerie disponibili sul mercato. Altri argomenti trattati nel libro sono: utilizzo di Bluetooth Low Energy, programmazione funzionale su Android con un particolare riferimento a RxJava, utilizzo di Android su device di tipologia diversa, dai wearable alle TV mediante il Chromecast, sicurezza delle applicazioni Android.

Il libro contiene 100 esercizi svolti, in ordine di difficoltà, spendibili nel posto di lavoro, per la programmazione dei PLC Siemens, edito nel 2022 alla sesta edizione aggiornata e ampliata. Basato su TIA Portal V17. È il secondo volume di 4 che formano la collana Let's Program a PLC che con ben 2500 pagine costituiscono i corsi di formazione che l'autore tiene a Padova. Oltre agli esercizi svolti Vi sono 25 esercizi proposti ma guidati verso la soluzione e 9 temi d'esame per le scuole superiori. Contiene 4 lavori reali tra cui l'auto apprendimento di una stiratrice automatica sviluppata con l'attuale rientro in produzione S7-200 Smart, l'impiego di sistemi HMI, sia Basic che Confort, programmati tramite WinCC connessi in PROFINET. Di estrema importanza un parcheggio interrato convertibile in magazzino automatizzato. Un pannello solare a inseguimento con tutte le fasi costruttive. Alcuni esercizi di programmazione avanzata nostrano come si interfaccia un motore trifase a un convertitore statico, G120, aprendo la strada a tutte le applicazioni reali. Concentra la ventiquennale esperienza, sia nel campo che in cattedra, maturata dall'autore. Una nuova impaginazione e la successione con cui si presentano gli argomenti sono ottimali per l'apprendimento. Testo unico nel suo genere che va ben oltre la normale didattica sul PLC. Edizioni di dott. ing. PhD Marco Gottardo.

Illustrators Annual 2020 is the 2020 edition of Chronicle Books' yearly publication celebrating artists featured at the Bologna Children's Book Fair. Selected by the year's jury at the fair, these illustrators represent the most daring, exciting artistic minds working across the world. Celebrating debut and storied talent from around the world--talent poised to engage a whole new generation of book lovers--this glorious compendium can be read cover-to-cover or browsed through at random. * An annual publication that brings groundbreaking art from around the world to the English-speaking market * Inspires readers to marvel at the brilliance of the gifts shared by children's book illustrators * Provides a fascinating peek into the world of global children's book illustration A highlight of the time-honored gathering of children's publishers in Bologna, Italy, the Illustrators Annual is juried every year from the finest art at the show. Every year a new issue is published, each filled with art that represents the best of illustration today--and to come. * A must-have inspirational source for illustrators, artists, designers, and art fans alike, as well as educators, librarians, independent bookstore employees, and hardcore fans of children's books * The Bologna Illustrators Annual has long been a prized resource for artists, illustrators, and designers. * Great for those who enjoyed Illustrating Children's Books: Creating Pictures for Publication by Martin Salisbury, Writing Picture Books: A Hands-On Guide From Story Creation to Publication by Ann Whitford Paul, A Poem for Peter: The Story of Ezra Jack Keats and the Creation of The Snowy Day by Andrea Davis Pinkney

Chronicles the life of the computer programmer, known for the launch of the operating system GNU

Project, from his childhood as a gifted student to his crusade for free software.

Il libro è stato scritto per soddisfare la richiesta delle tante persone che desiderano un manuale pratico che li guidi passo passo nello studio del PLC e dei sistemi di supervisione HMI. La scelta del PLC da impiegare è ricaduta su uno dei più diffusi attualmente in commercio ovvero un PLC Siemens della famiglia S7 1200 abbinato a un pannello operatore HMI. La struttura del libro è stata pensata affinché il lettore approfondisca man mano la conoscenza del PLC e della supervisione HMI e la applichi nello svolgimento degli esercizi di automazione. Gli esercizi svolti, contenuti nel testo, aiutano il lettore a comprendere la parte teorica trattata, e a potersi esercitare autonomamente con l'ambiente software Siemens TIA Portal. Tutti i progetti sono liberamente accessibili ed integralmente scaricabili dal sito www.numeroprimo.net

Il volume presenta le caratteristiche avanzate dei PLC Siemens S7-1200 e S7-1500, utilizzando nei progetti anche i moduli I/O analogici, l'orologio hardware e i pannelli operatori (HMI). Nel testo sono analizzate le configurazioni dell'hardware e poi, in modo più dettagliato, ma con un linguaggio sempre accessibile, le principali tecniche di programmazione avanzata, attraverso numerosi esempi scritti con la tecnica graficet-ladder e realizzati in TIA Portal con la programmazione strutturata, rendendo così più facile la comprensione del progetto. L'opera, divisa in moduli, propone all'interno di ognuno di essi un discreto numero di esercizi svolti e al termine domande ed esercizi da svolgere, molto utili per la revisione e il consolidamento dell'argomento sviluppato. Sono presenti anche numerose figure che illustrano l'utilizzo e le funzioni del software TIA Portal.

This book is the culmination of Marco Gottardo's teaching and work in electronics and automation. It is the first book in a self-teaching series that affords a solid foundation in PIC microcontroller programming. The book contains a range of fully explained problems and exercises, as well as three comprehensive essays, which are milestones for any industrial automation course. Key chapters are devoted to interrupt systems, analog signals, and LCD displays. The book looks at HITECH C language on IDE MPLAB software and on Micro GT Mini and IDE hardware platforms, which can be easily ordered online. It also explains LadderPIC, a language that enables microcontrollers to be programmed in the same way as PLCs. A follow-up, "Let's Make Robots!", will be published in December 2012.

Professional PLC programming è il quarto volume della collana di pubblicazioni di automazione industriale a cura del docente Gottardo Marco. Un testo unico che va ben oltre la sola programmazione del PLC, ma forma completamente l'impiegato dell'ufficio tecnico. Pubblicato alla fine del 2018 è destinato a diventare il testo di riferimento nel 2019 e anni successivi. Contiene le nozioni finali riguardanti il controllo di processo da effettuarsi programmando i nuovi PLC Siemens S7-1500 e S7-1200 di Siemens con l'attuale piattaforma TIA PORTAL V15. Fondamentale e estesa la sezione sul P&ID (Piping and Instrumentation) e lo sviluppo comprensione ed utilizzo degli schemi elettrici da parte del programmatore. Contiene nozioni immediatamente spendibili in ambito lavorativo. Vi sono descritti il processo di purificazione delle acque, processi siderurgici, sistemi per la produzione di energie alternative da biomassa, ecc. Tra gli strumenti software la comunicazione Profinet e Profibus, l'uso dei pannelli operatori con WinCC Confort, Il controllo assi, l'interfacciamento degli encoder, il controllo di motori con inverter e servodrive via Motion control. Estratti dalle normative vigenti, il deposito di marchi e brevetti e essenziali cenni di sicurezza sul lavoro. Il libro è uno strumento imman-

cabile negli uffici tecnici.