

DU Apps Studio

Scott Isaacs, Kyle Burns

Cross-Platform Modern Apps with VS Code Ockert J. du Preez, 2022-03-16 Simplified development of cross-platform applications by learning VS

Code

KEY FEATURES

- Covers sophisticated to simple web apps and webUIs development on VS Code with debugging.
- In-depth experimentation of VS Code including Machine Learning, NodeJS API and customized extensions.
- Provides refresher on popular tools like EF Core, Angular, Xamarin.Forms and Blazor.

DESCRIPTION This book explores VS Code's core features, including multi-language IDE, rapid programming, and innovative front-end development, to show readers how to design and debug modern online and cloud applications. You will learn how to build native apps, spend less time working with the platform, and focus more on the creative aspects of generating a smart UI. While you learn and practise on VS Code, you build solid grounds on robust server-side programming. You will learn how to use VS Code to develop your javascript, typescript, nodejs, or angular app more quickly and easily. Not only an application development environment, but VS Code also enables you to create microservices, extensions, and cloud applications. Not only can you construct applications with VS Code, but you can also develop microservices, extensions, and cloud applications. Throughout the book, you get trained on Entity Framework Core, Razor, Xamarin.Forms and numerous APIs. This book not only prepares you to design multi-platform applications or work with Visual Studio Code, but it also prepares you to be a great developer who can alter the code, debug issues, and manage the many versions on your own.

WHAT YOU WILL LEARN

- Engage Razor and ASP.NET Core to build dynamic web apps.
- Get a practical edge with Xamarin.Forms to experience the native development.
- Explore Entity Framework Core for building data-rich applications.
- Create a custom Visual Studio code extension for your application.
- Use a variety of APIs, such as NodeJS and Python, in your implementations.

WHO THIS BOOK IS FOR This book caters to application developers and web developers who want to develop multi-platform applications and authentic practice of VS Code environment. You are not required to have any programming experience, though some understanding of application development may help speed up the learnings.

TABLE OF CONTENTS

1. Comparing Visual Studio Code to Visual Studio
2. Up and Running with VS Code
3. Building Web UIs with Blazor
4. Building Websites with ASP.NET Core Razor Pages
5. Building Cross-Platform Mobile Apps with Xamarin.Forms
6. Building Web-Based Apps with Angular
7. Introducing Entity Framework Core
8. Exploring the Database Providers in Entity Framework Core
9. Building Multi-Platform Apps with Visual Studio Code
10. Building Services with Visual Studio Code
11. Application Deployment

Options 12. Working with Python, Node.JS, and other APIs 13. Creating Custom Extensions in Visual Studio Code 14. Appendix A

Visual Studio 2022 In-Depth Ockert J. du Preez, 2022-09-29 Develop Intelligent Hybrid and Cross-platform Applications with Powerful Coding Assistance for Developers DESCRIPTION Visual Studio 2022 is the most professional and sophisticated IDE for .NET and C# developers. This book provides comprehensive coverage of Visual Studio 2022, including all the tools and capabilities you can use to improve and streamline the software development process. Author Ockert J. du Preez takes you under the scenes of the Visual Studio IDE and guides you through the newest 2022 version in this revised and enlarged second edition. You will discover new areas of the application and the best way to utilize the capabilities you already know as soon as you install it. The following are some of the essential elements of this newer edition: ☐ Create cross-platform mobile and desktop applications using .NET MAUI. ☐ Utilize IntelliCode, an AI-powered code completion tool, for next-generation developer productivity. ☐ Work with the Razor Editor and troubleshoot problems with visualizations. ☐ Build, test, and debug .NET, C#, and C++ applications. ☐ Enhance coding skills to create effective web, mobile, and Azure solutions. ☐ Get Visual Studio 2022 rolling on Linux and macOS systems. ☐ Create and use custom IDE extensions. The book exemplifies topics such as extending Visual Studio with your customizations to make it function as you desire effectively. The book will help you learn everything you need to know about .NET 6, diagnosing and debugging programs, and utilizing all the collaborative tools in Visual Studio 2022. This book will teach you how to use the brand new AI IntelliCode and implement .NET MAUI and C++ 20 features. WHO THIS BOOK IS FOR This is the book for you, developers, and programmers who wish to master Visual Studio and produce high-quality code in any deployment setting and for any application. You only need to be familiar with .NET and C#. Nothing else is required. TABLE OF CONTENTS Section - I: Getting to Know the Visual Studio 2022 IDE 1. Getting Started with Visual Studio 2022 2. Having a Look at .NET 6 3. Language and Coding Changes in C# 4. Digging into the Visual Studio 2022 IDE Section - II: Using The Tools in Visual Studio 2022 5. AI IntelliCode 6. Built-in Coding Experience Tools 7. Diagnostics and Debugging Tools Section - III: Advanced Tools 8. Web Tools and Extensions 9. Mobile Tools 10. Azure Tools Section - IV: Advanced Topics 11. C++ 20 Appendix 'A'

High Performance Enterprise Apps using C# 10 and .NET 6 Ockert J. du Preez, 2022-07-30 Explore the ins-and-outs of optimizing your code to improve performance KEY FEATURES ☐ Contains a variety of approaches and tools for resolving, repairing, and fine-tuning enterprise applications. ☐

Learn to write clean and efficient codes to avoid performance bottlenecks. □ Get well versed with optimization and benchmarking tools to discover and fix poor-performing code. DESCRIPTION When making a large enterprise application, a lot of thought needs to go into the performance. This problem could have been prevented when applications are slow and have timeout errors, for example, and these errors keep happening. This book instructs developers on how to increase the efficiency of their code, detect and eliminate performance bottlenecks, and construct codes that simplify the software execution. This book teaches to improve the performance and reliability of apps so that the business runs smoothly. Readers will learn to employ the correct data types, different pattern matching, application profiling, and performance diagnostics. Various application challenges, including a large object heap, memory cache, system interoperability, and accurate collections, are thoroughly discussed with appropriate solutions. While exploring how to improve application performance, readers will gain hands-on experience with tools like Visual Studio Diagnostic Tools, JetBrains DotMemory, Red Gate ANTS, and dotTrace. Furthermore, readers get to practice writing clean codes, use of expert best practices, and design effective UIs responding appropriately to the server and the user. WHAT YOU WILL LEARN □ Develop the ability to recognise code with poor performance in every application. □ Prevent application performance issues by writing code free of errors and problems. □ Verify troublesome areas of the application's code with in-depth testing. □ Think creatively to create responsive user interfaces for individual users and applications. □ Get an opportunity to learn necessary C# commands quickly. □ Overcome the difficulties brought by InterOp, Hashtable, and Collection. WHO THIS BOOK IS FOR C# and .NET developers, application developers, web developers, and software developers are all looking forward to this book because they want to focus on producing high-quality apps rather than managing the development tool. TABLE OF CONTENTS Section-I: An Introduction to Code Performance and C# 1. The Need for High-Performance Code 2. Overview of C# 3. New and Improved features in C# 4. Using Data Types 5. Enhancing Pattern Matching 6. Using Collections Properly 7. Identifying Performance Problems 8. Benchmarking Code with BenchmarkDotNet 9. Dealing with the Memory Cache 10. Working with the Large Object Heap 11. Creating a Responsive UI 12. Overcoming InterOp Challenges

Visual Studio 2019 In Depth Ockert J. du Preez, 2019-09-18 Step-by-step guide to all the tools and extensions in the Visual Studio 2019 IDE

DESCRIPTION This book peeks into every corner of the Visual Studio IDE and will help you get started with the latest 2019 version. Right from installation, you'll discover new features within the tool and the optimal way to use the features you may already know. You'll learn, for example, how to

extend Visual Studio with your own customizations, so that you can make it perform the way you want. You will then explore everything about NuGet package, test applications using Live Unit Testing, and learn how to make code templates using the T4 code generation tool. You'll get to grips with the richer JavaScript IntelliSense, which will help you focus more on coding. Moving on, you'll learn to work with the dedicated workloads for data storage and data science. You will also review the more advanced architecture tools concealed within the IDE and finally create cloud-first applications powered by Microsoft Azure using the built-in suite of Azure tools.

KEY FEATURES









- Create and use custom IDE extensions
- Find, download, and use the best IDE extensions for web, mobile, Azure, and Windows
- Enhance programming experience and time with debugging tools
- Enhance coding capabilities with coding tools
- Test projects proactively
- Create powerful web, mobile, and Azure solutions for the real world







WHAT WILL YOU LEARN By the end of the book, you will be able to tackle any solution for any platform head-on. You will create real-world solutions from start to finish. By using the tools and extensions outlined in this book, you will be able to code better and faster, debug better, share your code with more peers, test your code better, and install or publish your apps quicker and without issues.

WHO THIS BOOK IS FOR The book is intended for any .NET developer. You can be a seasoned developer or a newbie just starting out. This book will play a pivotal role in presenting all the tools you need to become a better developer.

Table of Contents

1. Getting started with Visual Studio
2. Digging in the Visual Studio IDE
3. IntelliSense
4. Language & coding changes in C#
5. What's new in .Net core
6. Built-in tools
7. Debugging tools
8. Testing tools
9. ASP.NET tools
10. Mobile tools
11. Azure tools
12. IDE extensions
13. ASP.NET extensions
14. Mobile extensions
15. Azure DevOps extensions

Sun Tracker, Automatic Solar- Tracking, Sun- Tracking Systems, Solar Trackers and Automatic Sun Tracker Systems        

      Gerro Prinsloo, Robert Dobson, 2014-10-12 This book details Automatic Solar-Tracking, Sun-Tracking-Systems, Solar-Trackers and Sun Tracker Systems. An intelligent automatic solar tracker is a device that orients a payload toward the sun. Such programmable computer based solar tracking device includes principles of solar tracking, solar tracking systems, as well as microcontroller, microprocessor and/or PC based solar tracking control to orientate solar reflectors, solar lenses, photovoltaic panels or other optical configurations towards the sun. Motorized space frames and kinematic systems ensure motion dynamics and employ drive technology and gearing principles to steer optical configurations such as mangin, parabolic, conic, or cassegrain solar energy collectors to face the sun and follow the sun movement contour continuously. In harnessing power from the

sun through a solar tracker or practical solar tracking system, renewable energy control automation systems require automatic solar tracking software and solar position algorithms to accomplish dynamic motion control with control automation architecture, circuit boards and hardware. On-axis sun tracking system such as the altitude-azimuth dual axis or multi-axis solar tracker systems use a sun tracking algorithm or ray tracing sensors or software to ensure the sun's passage through the sky is traced with high precision in automated solar tracker applications, right through summer solstice, solar equinox and winter solstice. A high precision sun position calculator or sun position algorithm is this an important step in the design and construction of an automatic solar tracking system. From sun tracing software perspective, the sonnet Tracing The Sun has a literal meaning. Within the context of sun track and trace, this book explains that the sun's daily path across the sky is directed by relatively simple principles, and if grasped/understood, then it is relatively easy to trace the sun with sun following software. Sun position computer software for tracing the sun are available as open source code, sources that is listed in this book. Ironically there was even a system called sun chaser, said to have been a solar positioner system known for chasing the sun throughout the day. Using solar equations in an electronic circuit for automatic solar tracking is quite simple, even if you are a novice, but mathematical solar equations are over complicated by academic experts and professors in text-books, journal articles and internet websites. In terms of solar hobbies, scholars, students and Hobbyist's looking at solar tracking electronics or PC programs for solar tracking are usually overcome by the sheer volume of scientific material and internet resources, which leaves many developers in frustration when search for simple experimental solar tracking source-code for their on-axis sun-tracking systems. This booklet will simplify the search for the mystical sun tracking formulas for your sun tracker innovation and help you develop your own autonomous solar tracking controller. By directing the solar collector directly into the sun, a solar harvesting means or device can harness sunlight or thermal heat. This is achieved with the help of sun angle formulas, solar angle formulas or solar tracking procedures for the calculation of sun's position in the sky. Automatic sun tracking system software includes algorithms for solar altitude azimuth angle calculations required in following the sun across the sky. In using the longitude, latitude GPS coordinates of the solar tracker location, these sun tracking software tools supports precision solar tracking by determining the solar altitude-azimuth coordinates for the sun trajectory in altitude-azimuth tracking at the tracker location, using certain sun angle formulas in sun vector calculations. Instead of follow the sun software, a sun tracking sensor such as a sun sensor or webcam or video camera with vision based sun following image processing software can also be used to determine the position

of the sun optically. Such optical feedback devices are often used in solar panel tracking systems and dish tracking systems. Dynamic sun tracing is also used in solar surveying, DNI analyser and sun surveying systems that build solar infographics maps with solar radiance, irradiance and DNI models for GIS (geographical information system). In this way geospatial methods on solar/environment interaction makes use of geospatial technologies (GIS, Remote Sensing, and Cartography). Climatic data and weather station or weather center data, as well as queries from sky servers and solar resource database systems (i.e. on DB2, Sybase, Oracle, SQL, MySQL) may also be associated with solar GIS maps. In such solar resource modelling systems, a pyranometer or solarimeter is normally used in addition to measure direct and indirect, scattered, dispersed, reflective radiation for a particular geographical location. Sunlight analysis is important in flash photography where photographic lighting are important for photographers. GIS systems are used by architects who add sun shadow applets to study architectural shading or sun shadow analysis, solar flux calculations, optical modelling or to perform weather modelling. Such systems often employ a computer operated telescope type mechanism with ray tracing program software as a solar navigator or sun tracer that determines the solar position and intensity. The purpose of this booklet is to assist developers to track and trace suitable source-code and solar tracking algorithms for their application, whether a hobbyist, scientist, technician or engineer. Many open-source sun following and tracking algorithms and source-code for solar tracking programs and modules are freely available to download on the internet today. Certain proprietary solar tracker kits and solar tracking controllers include a software development kit SDK for its application programming interface API attributes (Pebble). Widget libraries, widget toolkits, GUI toolkit and UX libraries with graphical control elements are also available to construct the graphical user interface (GUI) for your solar tracking or solar power monitoring program. The solar library used by solar position calculators, solar simulation software and solar contour calculators include machine program code for the solar hardware controller which are software programmed into Micro-controllers, Programmable Logic Controllers PLC, programmable gate arrays, Arduino processor or PIC processor. PC based solar tracking is also high in demand using C++, Visual Basic VB, as well as MS Windows, Linux and Apple Mac based operating systems for sun path tables on Matlab, Excel. Some books and internet webpages use other terms, such as: sun angle calculator, sun position calculator or solar angle calculator. As said, such software code calculate the solar azimuth angle, solar altitude angle, solar elevation angle or the solar Zenith angle (Zenith solar angle is simply referenced from vertical plane, the mirror of the elevation angle measured from the horizontal or ground plane level). Similar

software code is also used in solar calculator apps or the solar power calculator apps for IOS and Android smartphone devices. Most of these smartphone solar mobile apps show the sun path and sun-angles for any location and date over a 24 hour period. Some smartphones include augmented reality features in which you can physically see and look at the solar path through your cell phone camera or mobile phone camera at your phone's specific GPS location. In the computer programming and digital signal processing (DSP) environment, (free/open source) program code are available for VB, .Net, Delphi, Python, C, C+, C++, PHP, Swift, ADM, F, Flash, Basic, QBasic, GBasic, KBasic, SIMPL language, Squirrel, Solaris, Assembly language on operating systems such as MS Windows, Apple Mac, DOS or Linux OS. Software algorithms predicting position of the sun in the sky are commonly available as graphical programming platforms such as Matlab (Mathworks), Simulink models, Java applets, TRNSYS simulations, Scada system apps, Labview module, Beckhoff TwinCAT (Visual Studio), Siemens SPA, mobile and iphone apps, Android or iOS tablet apps, and so forth. At the same time, PLC software code for a range of sun tracking automation technology can follow the profile of sun in sky for Siemens, HP, Panasonic, ABB, Allan Bradley, OMRON, SEW, Festo, Beckhoff, Rockwell, Schneider, Endress Hauser, Fuji electric. Honeywell, Fuchs, Yokonawa, or Mitsubishi platforms. Sun path projection software are also available for a range of modular IPC embedded PC motherboards, Industrial PC, PLC (Programmable Logic Controller) and PAC (Programmable Automation Controller) such as the Siemens S7-1200 or Siemens Logo, Beckhoff IPC or CX series, OMRON PLC, Ercam PLC, AC500plc ABB, National Instruments NI PXI or NI cRIO, PIC processor, Intel 8051/8085, IBM (Cell, Power, Brain or Truenorth series), FPGA (Xilinx Altera Nios), Intel, Xeon, Atmel megaAVR, MPU, Maple, Teensy, MSP, XMOS, Xbee, ARM, Raspberry Pi, Eagle, Arduino or Arduino AtMega microcontroller, with servo motor, stepper motor, direct current DC pulse width modulation PWM (current driver) or alternating current AC SPS or IPC variable frequency drives VFD motor drives (also termed adjustable-frequency drive, variable-speed drive, AC drive, micro drive or inverter drive) for electrical, mechatronic, pneumatic, or hydraulic solar tracking actuators. The above motion control and robot control systems include analogue or digital interfacing ports on the processors to allow for tracker angle orientation feedback control through one or a combination of angle sensor or angle encoder, shaft encoder, precision encoder, optical encoder, magnetic encoder, direction encoder, rotational encoder, chip encoder, tilt sensor, inclination sensor, or pitch sensor. Note that the tracker's elevation or zenith axis angle may be measured using an altitude angle-, declination angle-, inclination angle-, pitch angle-, or vertical angle-, zenith angle- sensor or inclinometer. Similarly the tracker's azimuth

axis angle be measured with a azimuth angle-, horizontal angle-, or roll angle- sensor. Chip integrated accelerometer magnetometer gyroscope type angle sensors can also be used to calculate displacement. Other options include the use of thermal imaging systems such as a Fluke thermal imager, or robotic or vision based solar tracker systems that employ face tracking, head tracking, hand tracking, eye tracking and car tracking principles in solar tracking. With unattended decentralised rural, island, isolated, or autonomous off-grid power installations, remote control, monitoring, data acquisition, digital datalogging and online measurement and verification equipment becomes crucial. It assists the operator with supervisory control to monitor the efficiency of remote renewable energy resources and systems and provide valuable web-based feedback in terms of CO₂ and clean development mechanism (CDM) reporting. A power quality analyser for diagnostics through internet, WiFi and cellular mobile links is most valuable in frontline troubleshooting and predictive maintenance, where quick diagnostic analysis is required to detect and prevent power quality issues. Solar tracker applications cover a wide spectrum of solar energy and concentrated solar devices, including solar power generation, solar desalination, solar water purification, solar steam generation, solar electricity generation, solar industrial process heat, solar thermal heat storage, solar food dryers, solar water pumping, hydrogen production from methane or producing hydrogen and oxygen from water (HHO) through electrolysis. Many patented or non-patented solar apparatus include tracking in solar apparatus for solar electric generator, solar desalinator, solar steam engine, solar ice maker, solar water purifier, solar cooling, solar refrigeration, USB solar charger, solar phone charging, portable solar charging tracker, solar coffee brewing, solar cooking or solar drying means. Your project may be the next breakthrough or patent, but your invention is held back by frustration in search for the sun tracker you require for your solar powered appliance, solar generator, solar tracker robot, solar freezer, solar cooker, solar drier, solar pump, solar freezer, or solar dryer project. Whether your solar electronic circuit diagram include a simplified solar controller design in a solar electricity project, solar power kit, solar hobby kit, solar steam generator, solar hot water system, solar ice maker, solar desalinator, hobbyist solar panels, hobby robot, or if you are developing professional or hobby electronics for a solar utility or micro scale solar powerplant for your own solar farm or solar farming, this publication may help accelerate the development of your solar tracking innovation. Lately, solar polygeneration, solar trigeneration (solar triple generation), and solar quad generation (adding delivery of steam, liquid/gaseous fuel, or capture food-grade CO₂) systems have need for automatic solar tracking. These systems are known for significant efficiency increases in energy yield as a result of the integration and re-use of waste or residual heat and are suitable

for compact packaged micro solar powerplants that could be manufactured and transported in kit-form and operate on a plug-and play basis. Typical hybrid solar power systems include compact or packaged solar micro combined heat and power (CHP or mCHP) or solar micro combined, cooling, heating and power (CCHP, CHPC, mCCHP, or mCHPC) systems used in distributed power generation. These systems are often combined in concentrated solar CSP and CPV smart microgrid configurations for off-grid rural, island or isolated microgrid, minigrid and distributed power renewable energy systems. Solar tracking algorithms are also used in modelling of trigeneration systems using Matlab Simulink (Modelica or TRNSYS) platform as well as in automation and control of renewable energy systems through intelligent parsing, multi-objective, adaptive learning control and control optimization strategies. Solar tracking algorithms also find application in developing solar models for country or location specific solar studies, for example in terms of measuring or analysis of the fluctuations of the solar radiation (i.e. direct and diffuse radiation) in a particular area. Solar DNI, solar irradiance and atmospheric information and models can thus be integrated into a solar map, solar atlas or geographical information systems (GIS). Such models allows for defining local parameters for specific regions that may be valuable in terms of the evaluation of different solar in photovoltaic of CSP systems on simulation and synthesis platforms such as Matlab and Simulink or in linear or multi-objective optimization algorithm platforms such as COMPOSE, EnergyPLAN or DER-CAM. A dual-axis solar tracker and single-axis solar tracker may use a sun tracker program or sun tracker algorithm to position a solar dish, solar panel array, heliostat array, PV panel, solar antenna or infrared solar nantenna. A self-tracking solar concentrator performs automatic solar tracking by computing the solar vector. Solar position algorithms (TwinCAT, SPA, or PSA Algorithms) use an astronomical algorithm to calculate the position of the sun. It uses astronomical software algorithms and equations for solar tracking in the calculation of sun's position in the sky for each location on the earth at any time of day. Like an optical solar telescope, the solar position algorithm pin-points the solar reflector at the sun and locks onto the sun's position to track the sun across the sky as the sun progresses throughout the day. Optical sensors such as photodiodes, light-dependant-resistors (LDR) or photoresistors are used as optical accuracy feedback devices. Lately we also included a section in the book (with links to microprocessor code) on how the PixArt Wii infrared camera in the Wii remote or Wiimote may be used in infrared solar tracking applications. In order to harvest free energy from the sun, some automatic solar positioning systems use an optical means to direct the solar tracking device. These solar tracking strategies use optical tracking techniques, such as a sun sensor means, to direct sun rays onto a silicon or CMOS substrate to determine the X

and Y coordinates of the sun's position. In a solar mems sun-sensor device, incident sunlight enters the sun sensor through a small pin-hole in a mask plate where light is exposed to a silicon substrate. In a web-camera or camera image processing sun tracking and sun following means, object tracking software performs multi object tracking or moving object tracking methods. In an solar object tracking technique, image processing software performs mathematical processing to box the outline of the apparent solar disc or sun blob within the captured image frame, while sun-localization is performed with an edge detection algorithm to determine the solar vector coordinates. An automated positioning system help maximize the yields of solar power plants through solar tracking control to harness sun's energy. In such renewable energy systems, the solar panel positioning system uses a sun tracking techniques and a solar angle calculator in positioning PV panels in photovoltaic systems and concentrated photovoltaic CPV systems. Automatic on-axis solar tracking in a PV solar tracking system can be dual-axis sun tracking or single-axis sun solar tracking. It is known that a motorized positioning system in a photovoltaic panel tracker increase energy yield and ensures increased power output, even in a single axis solar tracking configuration. Other applications such as robotic solar tracker or robotic solar tracking system uses robotica with artificial intelligence in the control optimization of energy yield in solar harvesting through a robotic tracking system. Automatic positioning systems in solar tracking designs are also used in other free energy generators, such as concentrated solar thermal power CSP and dish Stirling systems. The sun tracking device in a solar collector in a solar concentrator or solar collector Such a performs on-axis solar tracking, a dual axis solar tracker assists to harness energy from the sun through an optical solar collector, which can be a parabolic mirror, parabolic reflector, Fresnel lens or mirror array/matrix. A parabolic dish or reflector is dynamically steered using a transmission system or solar tracking slew drive mean. In steering the dish to face the sun, the power dish actuator and actuation means in a parabolic dish system optically focusses the sun's energy on the focal point of a parabolic dish or solar concentrating means. A Stirling engine, solar heat pipe, thermosyphin, solar phase change material PCM receiver, or a fibre optic sunlight receiver means is located at the focal point of the solar concentrator. The dish Stirling engine configuration is referred to as a dish Stirling system or Stirling power generation system. Hybrid solar power systems (used in combination with biogas, biofuel, petrol, ethanol, diesel, natural gas or PNG) use a combination of power sources to harness and store solar energy in a storage medium. Any multitude of energy sources can be combined through the use of controllers and the energy stored in batteries, phase change material, thermal heat storage, and in cogeneration form converted to the required power using thermodynamic cycles (organic

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Automatic Solar Tracking Sun Tracking Satellite Tracking rastreador solar seguimiento solar seguidor solar automático de seguimiento solar Gerro Prinsloo,Robert Dobson,2015-11-01 Automatic Solar Tracking Sun Tracking : This book details Automatic Solar-Tracking, Sun-Tracking-Systems, Solar-Trackers and Sun Tracker Systems. An intelligent automatic solar tracker is a device that orients a payload toward the sun. Such programmable computer based solar tracking device includes principles of solar tracking, solar tracking systems, as well as microcontroller, microprocessor and/or PC based solar tracking control to orientate solar reflectors, solar lenses, photovoltaic panels or other optical configurations towards the sun. Motorized space frames and kinematic systems ensure motion dynamics and employ drive technology and gearing principles to steer optical configurations such as mangin, parabolic, conic, or cassegrain solar energy collectors to face the sun and follow the sun movement contour continuously (seguimiento solar y automatización, automatización seguidor solar, tracking solar e automação, automação seguidor solar, inseguimento solare, inseguitore solare, energia termica, sole seguito, posizionatore motorizzato) In harnessing power from the sun through a solar tracker or practical solar tracking system, renewable energy control automation systems require automatic solar tracking software and solar position algorithms to accomplish dynamic motion control with control automation architecture, circuit boards and hardware. On-axis sun tracking system such as the altitude-azimuth dual axis or multi-axis solar tracker systems use a sun tracking algorithm or ray tracing sensors or software to ensure the sun's passage through the sky is traced with high

Automatic Solar Tracking Sun Tracking Satellite Tracking rastreador solar seguimiento solar seguidor solar automático de seguimiento solar Gerro Prinsloo,Robert Dobson,2015-11-01 Automatic Solar Tracking Sun Tracking : This book details Automatic Solar-Tracking, Sun-Tracking-Systems, Solar-Trackers and Sun Tracker Systems. An intelligent automatic solar tracker is a device that orients a payload toward the sun. Such programmable computer based solar tracking device includes principles of solar tracking, solar tracking systems, as well as microcontroller, microprocessor and/or PC based solar tracking control to orientate solar reflectors, solar lenses, photovoltaic panels or other optical configurations towards the sun. Motorized space frames and kinematic systems ensure motion dynamics and employ drive technology and gearing principles to steer optical configurations such as mangin, parabolic, conic, or cassegrain solar energy collectors to face the sun and follow the sun movement contour continuously (seguimiento solar y automatización, automatización seguidor solar, tracking solar e automação, automação seguidor solar, inseguimento solare, inseguitore solare, energia termica, sole seguito, posizionatore motorizzato) In harnessing power from the sun through a solar tracker or practical solar tracking system, renewable energy control automation systems require automatic solar tracking software and solar position algorithms to accomplish dynamic motion control with control automation architecture, circuit boards and hardware. On-axis sun tracking system such as the altitude-azimuth dual axis or multi-axis solar tracker systems use a sun tracking algorithm or ray tracing sensors or software to ensure the sun's passage through the sky is traced with high

precision in automated solar tracker applications, right through summer solstice, solar equinox and winter solstice. A high precision sun position calculator or sun position algorithm is this an important step in the design and construction of an automatic solar tracking system. The content of the book is also applicable to communication antenna satellite tracking and moon tracking algorithm source code for which links to free download links are provided. From sun tracing software perspective, the sonnet Tracing The Sun has a literal meaning. Within the context of sun track and trace, this book explains that the sun's daily path across the sky is directed by relatively simple principles, and if grasped/understood, then it is relatively easy to trace the sun with sun following software. Sun position computer software for tracing the sun are available as open source code, sources that is listed in this book. The book also describes the use of satellite tracking software and mechanisms in solar tracking applications. Ironically there was even a system called sun chaser, said to have been a solar positioner system known for chasing the sun throughout the day. Using solar equations in an electronic circuit for automatic solar tracking is quite simple, even if you are a novice, but mathematical solar equations are over complicated by academic experts and professors in text-books, journal articles and internet websites. In terms of solar hobbies, scholars, students and Hobbyist's looking at solar tracking electronics or PC programs for solar tracking are usually overcome by the sheer volume of scientific material and internet resources, which leaves many developers in frustration when search for simple experimental solar tracking source-code for their on-axis sun-tracking systems. This booklet will simplify the search for the mystical sun tracking formulas for your sun tracker innovation and help you develop your own autonomous solar tracking controller. By directing the solar collector directly into the sun, a solar harvesting means or device can harness sunlight or thermal heat. This is achieved with the help of sun angle formulas, solar angle formulas or solar tracking procedures for the calculation of sun's position in the sky. Automatic sun tracking system software includes algorithms for solar altitude azimuth angle calculations required in following the sun across the sky. In using the longitude, latitude GPS coordinates of the solar tracker location, these sun tracking software tools supports precision solar tracking by determining the solar altitude-azimuth coordinates for the sun trajectory in altitude-azimuth tracking at the tracker location, using certain sun angle formulas in sun vector calculations. Instead of follow the sun software, a sun tracking sensor such as a sun sensor or webcam or video camera with vision based sun following image processing software can also be used to determine the position of the sun optically. Such optical feedback devices are often used in solar panel tracking systems and dish tracking systems. Dynamic sun tracing is also used in solar surveying, DNI analyser and sun surveying systems that build solar

infographics maps with solar radiance, irradiance and DNI models for GIS (geographical information system). In this way geospatial methods on solar/environment interaction makes use of geospatial technologies (GIS, Remote Sensing, and Cartography). Climatic data and weather station or weather center data, as well as queries from sky servers and solar resource database systems (i.e. on DB2, Sybase, Oracle, SQL, MySQL) may also be associated with solar GIS maps. In such solar resource modelling systems, a pyranometer or solarimeter is normally used in addition to measure direct and indirect, scattered, dispersed, reflective radiation for a particular geographical location. Sunlight analysis is important in flash photography where photographic lighting are important for photographers. GIS systems are used by architects who add sun shadow applets to study architectural shading or sun shadow analysis, solar flux calculations, optical modelling or to perform weather modelling. Such systems often employ a computer operated telescope type mechanism with ray tracing program software as a solar navigator or sun tracer that determines the solar position and intensity. The purpose of this booklet is to assist developers to track and trace suitable source-code and solar tracking algorithms for their application, whether a hobbyist, scientist, technician or engineer. Many open-source sun following and tracking algorithms and source-code for solar tracking programs and modules are freely available to download on the internet today. Certain proprietary solar tracker kits and solar tracking controllers include a software development kit SDK for its application programming interface API attributes (Pebble). Widget libraries, widget toolkits, GUI toolkit and UX libraries with graphical control elements are also available to construct the graphical user interface (GUI) for your solar tracking or solar power monitoring program. The solar library used by solar position calculators, solar simulation software and solar contour calculators include machine program code for the solar hardware controller which are software programmed into Micro-controllers, Programmable Logic Controllers PLC, programmable gate arrays, Arduino processor or PIC processor. PC based solar tracking is also high in demand using C++, Visual Basic VB, as well as MS Windows, Linux and Apple Mac based operating systems for sun path tables on Matlab, Excel. Some books and internet webpages use other terms, such as: sun angle calculator, sun position calculator or solar angle calculator. As said, such software code calculate the solar azimuth angle, solar altitude angle, solar elevation angle or the solar Zenith angle (Zenith solar angle is simply referenced from vertical plane, the mirror of the elevation angle measured from the horizontal or ground plane level). Similar software code is also used in solar calculator apps or the solar power calculator apps for IOS and Android smartphone devices. Most of these smartphone solar mobile apps show the sun path and sun-angles for any location and date over a 24 hour period. Some

smartphones include augmented reality features in which you can physically see and look at the solar path through your cell phone camera or mobile phone camera at your phone's specific GPS location. In the computer programming and digital signal processing (DSP) environment, (free/open source) program code are available for VB, .Net, Delphi, Python, C, C+, C++, PHP, Swift, ADM, F, Flash, Basic, QBasic, GBasic, KBasic, SIMPL language, Squirrel, Solaris, Assembly language on operating systems such as MS Windows, Apple Mac, DOS or Linux OS. Software algorithms predicting position of the sun in the sky are commonly available as graphical programming platforms such as Matlab (Mathworks), Simulink models, Java applets, TRNSYS simulations, Scada system apps, Labview module, Beckhoff TwinCAT (Visual Studio), Siemens SPA, mobile and iphone apps, Android or iOS tablet apps, and so forth. At the same time, PLC software code for a range of sun tracking automation technology can follow the profile of sun in sky for Siemens, HP, Panasonic, ABB, Allan Bradley, OMRON, SEW, Festo, Beckhoff, Rockwell, Schneider, Endress Hauser, Fuji electric. Honeywell, Fuchs, Yokonawa, or Mitsubishi platforms. Sun path projection software are also available for a range of modular IPC embedded PC motherboards, Industrial PC, PLC (Programmable Logic Controller) and PAC (Programmable Automation Controller) such as the Siemens S7-1200 or Siemens Logo, Beckhoff IPC or CX series, OMRON PLC, Ercam PLC, AC500plc ABB, National Instruments NI PXI or NI cRIO, PIC processor, Intel 8051/8085, IBM (Cell, Power, Brain or Truenorth series), FPGA (Xilinx Altera Nios), Intel, Xeon, Atmel megaAVR, MPU, Maple, Teensy, MSP, XMOS, Xbee, ARM, Raspberry Pi, Eagle, Arduino or Arduino AtMega microcontroller, with servo motor, stepper motor, direct current DC pulse width modulation PWM (current driver) or alternating current AC SPS or IPC variable frequency drives VFD motor drives (also termed adjustable-frequency drive, variable-speed drive, AC drive, micro drive or inverter drive) for electrical, mechatronic, pneumatic, or hydraulic solar tracking actuators. The above motion control and robot control systems include analogue or digital interfacing ports on the processors to allow for tracker angle orientation feedback control through one or a combination of angle sensor or angle encoder, shaft encoder, precision encoder, optical encoder, magnetic encoder, direction encoder, rotational encoder, chip encoder, tilt sensor, inclination sensor, or pitch sensor. Note that the tracker's elevation or zenith axis angle may be measured using an altitude angle-, declination angle-, inclination angle-, pitch angle-, or vertical angle-, zenith angle- sensor or inclinometer. Similarly the tracker's azimuth axis angle be measured with a azimuth angle-, horizontal angle-, or roll angle- sensor. Chip integrated accelerometer magnetometer gyroscope type angle sensors can also be used to calculate displacement. Other options include the use of thermal imaging systems such as a Fluke thermal imager, or

robotic or vision based solar tracker systems that employ face tracking, head tracking, hand tracking, eye tracking and car tracking principles in solar tracking. With unattended decentralised rural, island, isolated, or autonomous off-grid power installations, remote control, monitoring, data acquisition, digital datalogging and online measurement and verification equipment becomes crucial. It assists the operator with supervisory control to monitor the efficiency of remote renewable energy resources and systems and provide valuable web-based feedback in terms of CO₂ and clean development mechanism (CDM) reporting. A power quality analyser for diagnostics through internet, WiFi and cellular mobile links is most valuable in frontline troubleshooting and predictive maintenance, where quick diagnostic analysis is required to detect and prevent power quality issues. Solar tracker applications cover a wide spectrum of solar applications and solar assisted application, including concentrated solar power generation, solar desalination, solar water purification, solar steam generation, solar electricity generation, solar industrial process heat, solar thermal heat storage, solar food dryers, solar water pumping, hydrogen production from methane or producing hydrogen and oxygen from water (HHO) through electrolysis. Many patented or non-patented solar apparatus include tracking in solar apparatus for solar electric generator, solar desalinator, solar steam engine, solar ice maker, solar water purifier, solar cooling, solar refrigeration, USB solar charger, solar phone charging, portable solar charging tracker, solar coffee brewing, solar cooking or solar drying means. Your project may be the next breakthrough or patent, but your invention is held back by frustration in search for the sun tracker you require for your solar powered appliance, solar generator, solar tracker robot, solar freezer, solar cooker, solar drier, solar pump, solar freezer, or solar dryer project. Whether your solar electronic circuit diagram include a simplified solar controller design in a solar electricity project, solar power kit, solar hobby kit, solar steam generator, solar hot water system, solar ice maker, solar desalinator, hobbyist solar panels, hobby robot, or if you are developing professional or hobby electronics for a solar utility or micro scale solar powerplant for your own solar farm or solar farming, this publication may help accelerate the development of your solar tracking innovation. Lately, solar polygeneration, solar trigeneration (solar triple generation), and solar quad generation (adding delivery of steam, liquid/gaseous fuel, or capture food-grade CO₂) systems have need for automatic solar tracking. These systems are known for significant efficiency increases in energy yield as a result of the integration and re-use of waste or residual heat and are suitable for compact packaged micro solar powerplants that could be manufactured and transported in kit-form and operate on a plug-and-play basis. Typical hybrid solar power systems include compact or packaged solar micro combined heat and power (CHP or mCHP) or solar micro

combined, cooling, heating and power (CCHP, CHPC, mCCHP, or mCHPC) systems used in distributed power generation. These systems are often combined in concentrated solar CSP and CPV smart microgrid configurations for off-grid rural, island or isolated microgrid, minigrid and distributed power renewable energy systems. Solar tracking algorithms are also used in modelling of trigeneration systems using Matlab Simulink (Modelica or TRNSYS) platform as well as in automation and control of renewable energy systems through intelligent parsing, multi-objective, adaptive learning control and control optimization strategies. Solar tracking algorithms also find application in developing solar models for country or location specific solar studies, for example in terms of measuring or analysis of the fluctuations of the solar radiation (i.e. direct and diffuse radiation) in a particular area. Solar DNI, solar irradiance and atmospheric information and models can thus be integrated into a solar map, solar atlas or geographical information systems (GIS). Such models allows for defining local parameters for specific regions that may be valuable in terms of the evaluation of different solar in photovoltaic of CSP systems on simulation and synthesis platforms such as Matlab and Simulink or in linear or multi-objective optimization algorithm platforms such as COMPOSE, EnergyPLAN or DER-CAM. A dual-axis solar tracker and single-axis solar tracker may use a sun tracker program or sun tracker algorithm to position a solar dish, solar panel array, heliostat array, PV panel, solar antenna or infrared solar nantenna. A self-tracking solar concentrator performs automatic solar tracking by computing the solar vector. Solar position algorithms (TwinCAT, SPA, or PSA Algorithms) use an astronomical algorithm to calculate the position of the sun. It uses astronomical software algorithms and equations for solar tracking in the calculation of sun's position in the sky for each location on the earth at any time of day. Like an optical solar telescope, the solar position algorithm pin-points the solar reflector at the sun and locks onto the sun's position to track the sun across the sky as the sun progresses throughout the day. Optical sensors such as photodiodes, light-dependant-resistors (LDR) or photoresistors are used as optical accuracy feedback devices. Lately we also included a section in the book (with links to microprocessor code) on how the PixArt Wii infrared camera in the Wii remote or Wiimote may be used in infrared solar tracking applications. In order to harvest free energy from the sun, some automatic solar positioning systems use an optical means to direct the solar tracking device. These solar tracking strategies use optical tracking techniques, such as a sun sensor means, to direct sun rays onto a silicon or CMOS substrate to determine the X and Y coordinates of the sun's position. In a solar mems sun-sensor device, incident sunlight enters the sun sensor through a small pin-hole in a mask plate where light is exposed to a silicon substrate. In a web-camera or camera image processing sun tracking and sun



Gerro Prinsloo, Robert Dobson, 2015-11-01 This book details Practical Solar Energy Harvesting, Automatic Solar-Tracking, Sun-Tracking-Systems, Solar-Trackers and Sun Tracker Systems using motorized automatic positioning concepts and control principles. An intelligent automatic solar tracker is a device that orients a payload toward the sun. Such programmable computer based solar tracking device includes principles of solar tracking, solar tracking systems, as well as microcontroller, microprocessor and/or PC based solar tracking control to orientate solar reflectors, solar lenses, photovoltaic panels or other optical configurations towards the sun. Motorized space frames and kinematic systems ensure motion dynamics and employ drive technology and gearing principles to steer optical configurations such as mangin, parabolic, conic, or cassegrain solar energy collectors to face the sun and follow the sun movement contour continuously. In general, the book may benefit solar research and solar energy applications in countries such as Africa, Mediterranean, Italy, Spain, Greece, USA, Mexico, South America, Brazilia, Argentina, Chili, India, Malaysia, Middle East, UAE, Russia, Japan and China. This book on practical automatic Solar-Tracking Sun-Tracking is in .PDF format and can easily be converted to the .EPUB .MOBI .AZW .ePub .FB2 .LIT .LRF .MOBI .PDB .PDF .TCR formats for smartphones and Kindle by using the ebook.online-convert.com facility. The content of the book is also applicable to communication antenna satellite tracking and moon tracking algorithm source code for which links to free download links are provided. In harnessing power from the sun through a solar tracker or practical solar tracking system, renewable energy control automation systems require automatic solar tracking software and solar position algorithms to accomplish dynamic motion control with control automation architecture, circuit boards and hardware. On-axis sun tracking system such as the altitude-azimuth dual axis or multi-axis solar tracker systems use a sun tracking algorithm or ray tracing sensors or software to ensure the sun's passage through the sky is traced with high precision in automated solar tracker applications, right through summer solstice, solar equinox and winter solstice. A high precision sun position calculator or sun position algorithm is this an important step in the design and construction of an automatic solar tracking system. From sun tracing software perspective, the sonnet Tracing The Sun has a literal meaning. Within the context of sun track and trace, this book explains that the sun's daily path across the sky is directed by relatively simple principles, and if grasped/understood, then it is relatively easy to trace the sun with sun following software. Sun position computer software for tracing the sun are available as open source code, sources that is listed in this book. Ironically there was even a system called sun chaser, said to have been a solar positioner system known for chasing the sun throughout the day. Using solar equations in an electronic circuit for automatic solar tracking is quite

simple, even if you are a novice, but mathematical solar equations are over complicated by academic experts and professors in text-books, journal articles and internet websites. In terms of solar hobbies, scholars, students and Hobbyist's looking at solar tracking electronics or PC programs for solar tracking are usually overcome by the sheer volume of scientific material and internet resources, which leaves many developers in frustration when search for simple experimental solar tracking source-code for their on-axis sun-tracking systems. This booklet will simplify the search for the mystical sun tracking formulas for your sun tracker innovation and help you develop your own autonomous solar tracking controller. By directing the solar collector directly into the sun, a solar harvesting means or device can harness sunlight or thermal heat. This is achieved with the help of sun angle formulas, solar angle formulas or solar tracking procedures for the calculation of sun's position in the sky. Automatic sun tracking system software includes algorithms for solar altitude azimuth angle calculations required in following the sun across the sky. In using the longitude, latitude GPS coordinates of the solar tracker location, these sun tracking software tools supports precision solar tracking by determining the solar altitude-azimuth coordinates for the sun trajectory in altitude-azimuth tracking at the tracker location, using certain sun angle formulas in sun vector calculations. Instead of follow the sun software, a sun tracking sensor such as a sun sensor or webcam or video camera with vision based sun following image processing software can also be used to determine the position of the sun optically. Such optical feedback devices are often used in solar panel tracking systems and dish tracking systems. Dynamic sun tracing is also used in solar surveying, DNI analyser and sun surveying systems that build solar infographics maps with solar radiance, irradiance and DNI models for GIS (geographical information system). In this way geospatial methods on solar/environment interaction makes use use of geospatial technologies (GIS, Remote Sensing, and Cartography). Climatic data and weather station or weather center data, as well as queries from sky servers and solar resource database systems (i.e. on DB2, Sybase, Oracle, SQL, MySQL) may also be associated with solar GIS maps. In such solar resource modelling systems, a pyranometer or solarimeter is normally used in addition to measure direct and indirect, scattered, dispersed, reflective radiation for a particular geographical location. Sunlight analysis is important in flash photography where photographic lighting are important for photographers. GIS systems are used by architects who add sun shadow applets to study architectural shading or sun shadow analysis, solar flux calculations, optical modelling or to perform weather modelling. Such systems often employ a computer operated telescope type mechanism with ray tracing program software as a solar navigator or sun tracer that determines the solar position and intensity. The purpose of this booklet is to

assist developers to track and trace suitable source-code and solar tracking algorithms for their application, whether a hobbyist, scientist, technician or engineer. Many open-source sun following and tracking algorithms and source-code for solar tracking programs and modules are freely available to download on the internet today. Certain proprietary solar tracker kits and solar tracking controllers include a software development kit SDK for its application programming interface API attributes (Pebble). Widget libraries, widget toolkits, GUI toolkit and UX libraries with graphical control elements are also available to construct the graphical user interface (GUI) for your solar tracking or solar power monitoring program. The solar library used by solar position calculators, solar simulation software and solar contour calculators include machine program code for the solar hardware controller which are software programmed into Micro-controllers, Programmable Logic Controllers PLC, programmable gate arrays, Arduino processor or PIC processor. PC based solar tracking is also high in demand using C++, Visual Basic VB, as well as MS Windows, Linux and Apple Mac based operating systems for sun path tables on Matlab, Excel. Some books and internet webpages use other terms, such as: sun angle calculator, sun position calculator or solar angle calculator. As said, such software code calculate the solar azimuth angle, solar altitude angle, solar elevation angle or the solar Zenith angle (Zenith solar angle is simply referenced from vertical plane, the mirror of the elevation angle measured from the horizontal or ground plane level). Similar software code is also used in solar calculator apps or the solar power calculator apps for IOS and Android smartphone devices. Most of these smartphone solar mobile apps show the sun path and sun-angles for any location and date over a 24 hour period. Some smartphones include augmented reality features in which you can physically see and look at the solar path through your cell phone camera or mobile phone camera at your phone's specific GPS location. In the computer programming and digital signal processing (DSP) environment, (free/open source) program code are available for VB, .Net, Delphi, Python, C, C+, C++, PHP, Swift, ADM, F, Flash, Basic, QBasic, GBasic, KBasic, SIMPL language, Squirrel, Solaris, Assembly language on operating systems such as MS Windows, Apple Mac, DOS or Linux OS. Software algorithms predicting position of the sun in the sky are commonly available as graphical programming platforms such as Matlab (Mathworks), Simulink models, Java applets, TRNSYS simulations, Scada system apps, Labview module, Beckhoff TwinCAT (Visual Studio), Siemens SPA, mobile and iphone apps, Android or iOS tablet apps, and so forth. At the same time, PLC software code for a range of sun tracking automation technology can follow the profile of sun in sky for Siemens, HP, Panasonic, ABB, Allan Bradley, OMRON, SEW, Festo, Beckhoff, Rockwell, Schneider, Endress Hauser, Fudji electric. Honeywell, Fuchs, Yokonawa, or

Muthibishi platforms. Sun path projection software are also available for a range of modular IPC embedded PC motherboards, Industrial PC, PLC (Programmable Logic Controller) and PAC (Programmable Automation Controller) such as the Siemens S7-1200 or Siemens Logo, Beckhoff IPC or CX series, OMRON PLC, Ercam PLC, AC500plc ABB, National Instruments NI PXI or NI cRIO, PIC processor, Intel 8051/8085, IBM (Cell, Power, Brain or Truenorth series), FPGA (Xilinx Altera Nios), Intel, Xeon, Atmel megaAVR, MPU, Maple, Teensy, MSP, XMOS, Xbee, ARM, Raspberry Pi, Eagle, Arduino or Arduino AtMega microcontroller, with servo motor, stepper motor, direct current DC pulse width modulation PWM (current driver) or alternating current AC SPS or IPC variable frequency drives VFD motor drives (also termed adjustable-frequency drive, variable-speed drive, AC drive, micro drive or inverter drive) for electrical, mechatronic, pneumatic, or hydraulic solar tracking actuators. The above motion control and robot control systems include analogue or digital interfacing ports on the processors to allow for tracker angle orientation feedback control through one or a combination of angle sensor or angle encoder, shaft encoder, precision encoder, optical encoder, magnetic encoder, direction encoder, rotational encoder, chip encoder, tilt sensor, inclination sensor, or pitch sensor. Note that the tracker's elevation or zenith axis angle may measured using an altitude angle-, declination angle-, inclination angle-, pitch angle-, or vertical angle-, zenith angle- sensor or inclinometer. Similarly the tracker's azimuth axis angle be measured with a azimuth angle-, horizontal angle-, or roll angle- sensor. Chip integrated accelerometer magnetometer gyroscope type angle sensors can also be used to calculate displacement. Other options include the use of thermal imaging systems such as a Fluke thermal imager, or robotic or vision based solar tracker systems that employ face tracking, head tracking, hand tracking, eye tracking and car tracking principles in solar tracking. With unattended decentralised rural, island, isolated, or autonomous off-grid power installations, remote control, monitoring, data acquisition, digital datalogging and online measurement and verification equipment becomes crucial. It assists the operator with supervisory control to monitor the efficiency of remote renewable energy resources and systems and provide valuable web-based feedback in terms of CO2 and clean development mechanism (CDM) reporting. A power quality analyser for diagnostics through internet, WiFi and cellular mobile links is most valuable in frontline troubleshooting and predictive maintenance, where quick diagnostic analysis is required to detect and prevent power quality issues. Solar tracker applications cover a wide spectrum of solar applications and solar assisted application, including concentrated solar power generation, solar desalination, solar water purification, solar steam generation, solar electricity generation, solar industrial process heat, solar thermal heat storage, solar food dryers,

solar water pumping, hydrogen production from methane or producing hydrogen and oxygen from water (HHO) through electrolysis. Many patented or non-patented solar apparatus include tracking in solar apparatus for solar electric generator, solar desalinator, solar steam engine, solar ice maker, solar water purifier, solar cooling, solar refrigeration, USB solar charger, solar phone charging, portable solar charging tracker, solar coffee brewing, solar cooking or solar drying means. Your project may be the next breakthrough or patent, but your invention is held back by frustration in search for the sun tracker you require for your solar powered appliance, solar generator, solar tracker robot, solar freezer, solar cooker, solar drier, solar pump, solar freezer, or solar dryer project. Whether your solar electronic circuit diagram include a simplified solar controller design in a solar electricity project, solar power kit, solar hobby kit, solar steam generator, solar hot water system, solar ice maker, solar desalinator, hobbyist solar panels, hobby robot, or if you are developing professional or hobby electronics for a solar utility or micro scale solar powerplant for your own solar farm or solar farming, this publication may help accelerate the development of your solar tracking innovation. Lately, solar polygeneration, solar trigeneration (solar triple generation), and solar quad generation (adding delivery of steam, liquid/gaseous fuel, or capture food-grade CO₂) systems have need for automatic solar tracking. These systems are known for significant efficiency increases in energy yield as a result of the integration and re-use of waste or residual heat and are suitable for compact packaged micro solar powerplants that could be manufactured and transported in kit-form and operate on a plug-and play basis. Typical hybrid solar power systems include compact or packaged solar micro combined heat and power (CHP or mCHP) or solar micro combined, cooling, heating and power (CCHP, CHPC, mCCHP, or mCHPC) systems used in distributed power generation. These systems are often combined in concentrated solar CSP and CPV smart microgrid configurations for off-grid rural, island or isolated microgrid, minigrid and distributed power renewable energy systems. Solar tracking algorithms are also used in modelling of trigeneration systems using Matlab Simulink (Modelica or TRNSYS) platform as well as in automation and control of renewable energy systems through intelligent parsing, multi-objective, adaptive learning control and control optimization strategies. Solar tracking algorithms also find application in developing solar models for country or location specific solar studies, for example in terms of measuring or analysis of the fluctuations of the solar radiation (i.e. direct and diffuse radiation) in a particular area. Solar DNI, solar irradiance and atmospheric information and models can thus be integrated into a solar map, solar atlas or geographical information systems (GIS). Such models allows for defining local parameters for specific regions that may be valuable in terms of the evaluation of different solar in

photovoltaic of CSP systems on simulation and synthesis platforms such as Matlab and Simulink or in linear or multi-objective optimization algorithm platforms such as COMPOSE, EnergyPLAN or DER-CAM. A dual-axis solar tracker and single-axis solar tracker may use a sun tracker program or sun tracker algorithm to position a solar dish, solar panel array, heliostat array, PV panel, solar antenna or infrared solar nan antenna. A self-tracking solar concentrator performs automatic solar tracking by computing the solar vector. Solar position algorithms (TwinCAT, SPA, or PSA Algorithms) use an astronomical algorithm to calculate the position of the sun. It uses astronomical software algorithms and equations for solar tracking in the calculation of sun's position in the sky for each location on the earth at any time of day. Like an optical solar telescope, the solar position algorithm pin-points the solar reflector at the sun and locks onto the sun's position to track the sun across the sky as the sun progresses throughout the day. Optical sensors such as photodiodes, light-dependant-resistors (LDR) or photoresistors are used as optical accuracy feedback devices. Lately we also included a section in the book (with links to microprocessor code) on how the PixArt Wii infrared camera in the Wii remote or Wiimote may be used in infrared solar tracking applications. In order to harvest free energy from the sun, some automatic solar positioning systems use an optical means to direct the solar tracking device. These solar tracking strategies use optical tracking techniques, such as a sun sensor means, to direct sun rays onto a silicon or CMOS substrate to determine the X and Y coordinates of the sun's position. In a solar mems sun-sensor device, incident sunlight enters the sun sensor through a small pin-hole in a mask plate where light is exposed to a silicon substrate. In a web-camera or camera image processing sun tracking and sun following means, object tracking software performs multi object tracking or moving object tracking methods. In an solar object tracking technique, image processing software performs mathematical processing to box the outline of the apparent solar disc or sun blob within the captured image frame, while sun-localization is performed with an edge detection algorithm to determine the solar vector coordinates. An automated positioning system help maximize the yields of solar power plants through solar tracking control to harness sun's energy. In such renewable energy systems, the solar panel positioning system uses a sun tracking techniques and a solar angle calculator in positioning PV panels in photovoltaic systems and concentrated photovoltaic CPV systems. Automatic on-axis solar tracking in a PV solar tracking system can be dual-axis sun tracking or single-axis sun solar tracking. It is known that a motorized positioning system in a photovoltaic panel tracker increase energy yield and ensures increased power output, even in a single axis solar tracking configuration. Other applications such as robotic solar tracker or robotic solar tracking system uses robotica with artificial

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partage sa vision et ses connaissances sur les capacités d'extension de SharePoint apportées par les quatre logiciels de la PowerPlatform, en organisant son propos suivant les angles No Code puis Low Code.

Beginning Facebook Game Apps Development Wayne Graham, 2012-06-10 Today's Facebook is emerging to become tomorrow's operating system, according to some. Certainly, a WebOS. Web standards-based apps using HTML5, JavaScript, CSS3 and more are now possible on Facebook. Why not get started with developing and selling Facebook game apps on Facebook's App Store? *Beginning Facebook Game Apps Development* gets you started with building your first game apps that run on Facebook. Become your own Zynga and create your own Civilization or Farmville and more. Build rich Web-based apps that you can sell on Facebook's App Store. Because these apps are built on Web standards, you can build and run on many browsers and—more interestingly—more computers, tablets, smartphones and even other devices and appliances that are Web-connected or enabled.

Theoretical Aspects of Software Engineering Cristina David, Meng Sun, 2023-06-26 This book constitutes the proceedings of the 17th International Conference on Theoretical Aspects of Software Engineering, TASE 2023, held in Bristol, UK, July 4–6, 2023. The 19 full papers and 2 short papers included in this book were carefully reviewed and selected from 49 submissions. They cover the following areas: distributed and concurrent systems; cyber-physical systems; embedded and real-time systems; object-oriented systems; quantum computing; formal verification and program semantics; static analysis; formal methods; verification and testing for AI systems; and AI for formal methods.

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Sun Tracking and Solar Renewable Energy Harvesting Gerro Prinsloo, Robert Dobson, 2015-11-02 Free to download eBook on Practical Solar Tracking Design, Solar Tracking, Sun Tracking, Sun Tracker, Solar Tracker, Follow Sun, Sun Position calculation (Azimuth, Elevation, Zenith), Sun following, Sunrise, Sunset, Moon-phase, Moonrise, Moonset calculators. In harnessing power from the sun through a solar tracker or solar tracking system, renewable energy system developers require automatic solar tracking software and solar position algorithms. On-axis sun tracking system such as the altitude-azimuth dual axis or multi-axis solar tracker systems use a sun tracking algorithm or ray tracing sensors or software to ensure the sun's passage through the sky is traced with high precision in automated solar tracker applications, right through summer solstice, solar equinox and winter solstice. Eco Friendly and Environmentally Sustainable Micro Combined Solar Heat and Power (m-CHP, m-CCHP, m-CHCP) with Microgrid Storage and

Layered Smartgrid Control towards Supplying Off-Grid Rural Villages in developing BRICS countries such as Africa, India, China and Brazil. Off-grid rural villages and isolated islands areas require mCHP and trigeneration solar power plants and associated isolated smart microgrid solutions to serve the community energy needs. This article describes the development progress for such a system, also referred to as solar polygeneration. The system includes a sun tracker mechanism wherein a parabolic dish or lenses are guided by a light sensitive mechanism in a way that the solar receiver is always at right angle to the solar radiation. Solar thermal energy is then either converted into electrical energy through a free piston Stirling, or stored in a thermal storage container. The project includes the thermodynamic modeling of the plant in Matlab Simulink as well as the development of an intelligent control approach that includes smart microgrid distribution and optimization. The book includes aspects in the simulation and optimization of stand-alone hybrid renewable energy systems and co-generation in isolated or islanded microgrids. It focusses on the stepwise development of a hybrid solar driven micro combined cooling heating and power (mCCHP) compact trigeneration polygeneration and thermal energy storage (TES) system with intelligent weather prediction, weak-ahead scheduling (time horizon), and look-ahead dispatch on integrated smart microgrid distribution principles. The solar harvesting and solar thermodynamic system includes an automatic sun tracking platform based on a PLC controlled mechatronic sun tracking system that follows the sun progressing across the sky. An intelligent energy management and adaptive learning control optimization approach is proposed for autonomous off-grid remote power applications, both for thermodynamic optimization and smart micro-grid optimization for distributed energy resources (DER). The correct resolution of this load-following multi objective optimization problem is a complex task because of the high number and multi-dimensional variables, the cross-correlation and interdependency between the energy streams as well as the non-linearity in the performance of some of the system components. Exergy-based control approaches for smartgrid topologies are considered in terms of the intelligence behind the safe and reliable operation of a microgrid in an automated system that can manage energy flow in electrical as well as thermal energy systems. The standalone micro-grid solution would be suitable for a rural village, intelligent building, district energy system, campus power, shopping mall centre, isolated network, eco estate or remote island application setting where self-generation and decentralized energy system concepts play a role. Discrete digital simulation models for the thermodynamic and active demand side management systems with digital smartgrid control unit to optimize the system energy management is currently under development. Parametric simulation models for this trigeneration system (polygeneration, poligeneration,

quadgeneration) are developed on the Matlab Simulink and TrnSys platforms. In terms of model predictive coding strategies, the automation controller will perform multi-objective cost optimization for energy management on a microgrid level by managing the generation and storage of electrical, heat and cooling energies in layers. Each layer has its own set of smart microgrid priorities associated with user demand side cycle predictions. Mixed Integer Linear Programming and Neural network algorithms are being modeled to perform Multi Objective Control optimization as potential optimization and adaptive learning techniques.

Beginning Windows Store Application Development – HTML and JavaScript Edition Scott Isaacs, Kyle Burns, 2013-09-09

Beginning Windows Store Application Development – HTML and JavaScript Edition introduces you to the Windows 8 modern app design paradigm and the new Windows 8 programming model developed around this paradigm. You'll learn to build rich, immersive applications designed to run on the many devices powered by Windows 8. The authors draw on their extensive practical experience to provide not only a comprehensive introduction to the model and its features, but guidance on best practices and a real-world sample application that you develop over the course of the book. Beginning Windows Store Application Development – HTML and JavaScript Edition also emphasizes how devices will be used and applications will be built in a world that has become far more connected. The book takes you beyond the syntax of any development language and examines factors such as application design, user experience, social integration, and maintaining data and settings across multiple devices. What you'll learn

- Apply Windows 8 modern UI style design guidelines to build effective user interfaces
- Use the new programming libraries available in Windows 8
- Effectively use application tiles and notifications
- Integrate with Windows by exposing your application's data to Windows Search and Share menus
- Consume services to bring data into your application
- Use the cloud to share data and application settings across multiple devices
- Publish your applications in the Windows Store

Who this book is for

Beginning Windows Store Application Development – HTML and JavaScript Edition is for the novice programmer with a basic understanding of web development who is interested in learning how to build the next generation of applications designed to run on Windows 8. Readers who already have an understanding of HTML, CSS and JavaScript will get the most out of the book. It also is an excellent choice for more experienced developers who want to get started programming for Windows 8.

Table of Contents

- Welcome to a Touch First World
- The Microsoft Design Language
- Designing Windows Store Applications
- Visual Studio 2012 and Windows Store Application Types
- HTML Controls
- WinJS Controls
- WinJS Collection Controls
- WinJS Custom

Controls Building the User Interface Transitions and Animations Data Binding Concepts Promises Web Workers Data Source Options Session State and Settings Files Handling State Changes External Libraries Windows Search and Share Printing Notifications and Tiles Sensors, Devices and Location Publishing Apps in the Windows Store

Android-Apps programmieren für Kids Hans-Georg Schumann, 2018-09-21 - Schritt für Schritt eigene Apps entwickeln - Viel Spaß mit selbst programmiertem Code und Smartphone-Spielen - Mit Fragen und Aufgaben am Ende jedes Kapitels Hattest du auch schon mal eine Idee für eine Smartphone-App, aber keinen blassen Schimmer, wie sich so etwas umsetzen lässt? In dieser Neuauflage programmiert unser Autor Hans-Georg Schumann zusammen mit dir lustige Spiele-Apps mit Android Studio 3 und der Programmiersprache Java. Du lernst, mit Komponenten zu arbeiten und traust dich nach und nach auch an komplexere Projekte heran. Aber keine Sorge: Das hört sich schwieriger an, als es ist. Du lernst Schritt für Schritt und findest am Ende jedes Kapitels Zusammenfassungen, Übungen und Aufgaben, damit du alles Gelernte noch einmal in Ruhe sacken lassen kannst. Außerdem erhältst du genaue Anleitungen, wie du diese Spiele-Apps in den verschiedensten Varianten programmierst, die alle richtig Spaß machen! Aus dem Inhalt: · Android Studio starten und den ersten eigenen Code programmieren · Wie man einen Android-Emulator einsetzt · Buttons Leben einhauchen und das Layout einer App anpassen · Variablen, Strings, Operatoren und Zeichenketten kennenlernen · Etwas über das Objekt-orientierte Programmieren erfahren · Apps für Mathe und Zensuren sowie ein kleines Ratespiel entwickeln · Bilder einsetzen und Animationen erstellen · Mit Kollisionen in einem Spiel umgehen · Die Spiele »Wanzenjagd« und »Dodger« programmieren

Android-Apps entwickeln für Kids Hans-Georg Schumann, 2015-03-18 Hattest du auch schon selbst einen tollen Geistesblitz für eine Smartphone-App, aber keinen blassen Schimmer, wie sich solch eine Idee in ein kleines Programm umsetzen lässt? »... für Kids«-Autor Hans-Georg Schumann programmiert in diesem Buch zusammen mit dir lustige Spiele-Apps mit Android Studio und der Programmiersprache Java. Du lernst, mit Komponenten zu arbeiten und traust dich auch an komplexere Projekte heran. Das hört sich schwieriger an, als es ist, doch du lernst alles Schritt für Schritt und findest am Ende jedes Kapitels Zusammenfassungen, Übungen und Aufgaben. So kannst du alles Gelernte noch einmal in Ruhe sacken lassen. Du erhältst eine genaue Anleitung, wie du eine kleine Wanzenjagd-App in den verschiedensten Varianten programmierst, die nebenbei noch richtig Spaß macht!

Der Wettlauf um die Digitalisierung Kai Lucks, 2020-02-03 Die aktuellen Herausforderungen unseres Landes werden in diesem Buch systematisch erarbeitet: Kann das »Modell Deutschland«, das als Sozialstaat für attraktive Arbeitsplätze, für Wissenschaft, für freiheitliches Denken und Umweltschutz steht, überhaupt gegen die radikalen Digital-Ansätze in den USA und Chinas erfolgreichen Widerstand leisten? In einem umfassenden Spannungsbogen werden historische Entwicklungen technologischer, wirtschaftlicher und gesellschaftlicher Natur dargestellt, unsere derzeitigen Infrastrukturen, Managementverfahren und Cyber Security betrachtet und herausragend wichtige Gebiete, deren weitergehende Digitalisierung wettbewerbsentscheidend ist, analysiert. Orientierung über alle Bereiche, die der Digitalisierung ausgesetzt sind: - Künstliche Intelligenz, Energiewirtschaft, Mobilität, Online-Handel, Smart Government u.v.m. - Deutschland im Vergleich und in Beziehung mit den USA und China - Das Management des digitalen Wandels - Organischer Umbau: digitalgetriebene Wertschöpfung - Externer Umbau: Digitalisierung M&A - Die Digitalisierung des Mittelstandes - Arbeitswelt in der digitalen Gesellschaft - Folgerungen für die digitale Zukunft und Anstöße zu einem Digitalprogramm Deutschland

Stop-Motion-Trickfilme Selber Machen Für Dummies Junior Michaela Weiß, Vera Borngässer, 2023-03-08 YouTube-Videos schauen kann jeder, aber einen Stop-Motion-Trickfilm selbst produzieren? Das ist ganz einfach: Denke dir eine Geschichte aus und bastle aus einfachen Materialien Figuren. Lass die Puppen tanzen und vermische Wirklichkeit und Fantasie. Hintergründe und Ton-Dateien bieten wir dir zum Download an. Im Buch findest du außerdem jede Menge Tipps zu Beleuchtung, Geräuschen, Anordnung der Figuren und Spezialeffekten. Sei kreativ, bearbeite die Filme am Computer weiter und verblüffe Freunde und Familie mit deinem Video. Wir zeigen dir Schritt für Schritt, wie es geht. Bestens geeignet für Kinder und Jugendliche ab 8 Jahre.

Recharge Your Library Programs with Pop Culture and Technology: Linda D. Behen, 2013-06-17 Learn how to integrate pop culture and technology into school library programs and classrooms, and make today's digital content, mobile devices, and students' changing interests work to the educator's advantage. Today's school libraries need to evolve and meet the needs of 21st-century students—the instruction, programming, and library services must be relevant to today's learners. Additionally, the interactions between educators and the students are what make the critical difference in the students' learning, and turn the library and classroom into places where they will find, assimilate, experience, and understand information. This book provides practical strategies for using pop culture and technology trends to connect with easily distracted middle and high school students and hold their attention.

Author Linda D. Behen addresses why school libraries are in transition and why there is a need for dramatic change. She discusses the evolution of all libraries in response to digital content; ubiquitous mobile devices such as smart phones, iPads, and other tablet computers; patrons' changing interests; and the ways in which schools and school libraries have found to effectively adapt to technology changes and student needs. This book is essential for middle and high school librarians and educators, library school students and instructors, and young adult public librarians.

Learn Microsoft Visual Studio App Center Sunny Mukherjee, 2019 Use Visual Studio App Center with Xamarin forms to set up a DevOps CI/CD pipeline, set up your mobile builds on either iOS or Android, set up Android and Apple certificates and provisioning profiles, distribute your app to your developers and testers, capture analytics and crashes from your users, communicate to your users with push notifications, and run UI tests on the Microsoft cloud. You will see how to automate and manage the life cycle of your apps through Microsoft's Cloud Service, with a focus on integrating App Center into your Xamarin forms apps with clear, practical examples. As you follow along with the sample app in this book, you will see how easy it is to configure your builds, to test the sample app on various iOS and Android devices on the App Center cloud, and to distribute your app to real devices. Whether you are a developer on a small team or a startup or an architect in a large organization curious about the benefits of Visual Studio App Center, after finishing this book, you will be confident in setting up App Center on your next mobile project. Come join me on this journey through Visual Studio App Center with Xamarin forms.--

100 Aplikasi Android Paling Dahsyat Jubilee Enterprise, 2013-12-20 Ada ribuan aplikasi di dunia Android. Namun hanya puluhan aplikasi saja yang paling Anda butuhkan dan paling penting untuk mendukung pekerjaan dan minat kita sehari-hari. Nah, daripada Anda menginstal dan menghapus aplikasi-aplikasi yang telah terpasang itu satu demi satu, akan lebih baik jika Anda membaca buku ini. Di dalam buku ini, Anda akan menemukan aplikasi-aplikasi Android yang dianggap paling menarik, penting, dan mendukung pekerjaan serta aktivitas sehari-hari. Aplikasi yang dibahas di dalam buku ini dibagi dalam sembilan kategori, seperti fotografi, musik, optimalisasi Android, transaksi keuangan dan belanja, serta banyak lagi. Anda akan menemukan aplikasi populer seperti Facebook hingga unik seperti GateGuru yang membantu Anda memonitor penerbangan di lebih dari 200 bandara seluruh dunia. Buku ini akan mengefisienkan proses seleksi terhadap aplikasi-aplikasi yang ada di dunia Google Play. Anda tidak perlu lagi menginstal dan menghapus aplikasi satu demi satu hanya untuk menemukan aplikasi yang paling bagus. Cukup baca buku ini dan Anda akan menemukan aplikasi

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Table of Contents DU Apps Studio

1. Understanding the eBook DU Apps Studio

- The Rise of Digital Reading DU Apps Studio
- Advantages of eBooks Over Traditional Books

2. Identifying DU Apps Studio

- Exploring Different Genres
- Considering Fiction vs. Non-Fiction
- Determining Your Reading Goals

3. Choosing the Right eBook Platform

- Popular eBook Platforms
- Features to Look for in an DU Apps Studio
- User-Friendly Interface

4. Exploring eBook Recommendations from DU Apps Studio

- Personalized Recommendations
- DU Apps Studio User Reviews and Ratings
- DU Apps Studio and Bestseller Lists

5. Accessing DU Apps Studio Free and Paid eBooks

- DU Apps Studio Public Domain eBooks
- DU Apps Studio eBook Subscription Services
- DU Apps Studio Budget-Friendly Options

6. Navigating DU Apps Studio eBook Formats

- ePub, PDF, MOBI, and More

- DU Apps Studio Compatibility with Devices
 - DU Apps Studio Enhanced eBook Features
7. Enhancing Your Reading Experience
- Adjustable Fonts and Text Sizes of DU Apps Studio
 - Highlighting and Note-Taking DU Apps Studio
 - Interactive Elements DU Apps Studio
8. Staying Engaged with DU Apps Studio
- Joining Online Reading Communities
 - Participating in Virtual Book Clubs
 - Following Authors and Publishers DU Apps Studio
9. Balancing eBooks and Physical Books DU Apps Studio
- Benefits of a Digital Library
 - Creating a Diverse Reading
- Collection DU Apps Studio
10. Overcoming Reading Challenges
- Dealing with Digital Eye Strain
 - Minimizing Distractions
 - Managing Screen Time
11. Cultivating a Reading Routine DU Apps Studio
- Setting Reading Goals DU Apps Studio
 - Carving Out Dedicated Reading Time
12. Sourcing Reliable Information of DU Apps Studio
- Fact-Checking eBook Content of DU Apps Studio
 - Distinguishing Credible Sources
13. Promoting Lifelong Learning
- Utilizing eBooks for Skill Development
 - Exploring Educational eBooks
14. Embracing eBook Trends

- Integration of Multimedia Elements
- Interactive and Gamified eBooks

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<u>protocole de contraception du québec institut national de santé</u> - Oct 28 2022	connaissances attitudes et pratiques en matière de santé de la - Feb 17 2022	contraception world health organization who - Jun 04 2023
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