

## **Les Capteurs Pour Arduino Et Raspberry Pi Tutoriels Et Projets Tutoriels Et Projets Hors Collection**

Make: Sensors is the definitive introduction and guide to the sometimes-tricky world of using sensors to monitor the physical world. With dozens of projects and experiments for you to build, this book shows you how to build sensor projects with both Arduino and Raspberry Pi. Use Arduino when you need a low-power, low-complexity brain for your sensor, and choose Raspberry Pi when you need to perform additional processing using the Linux operating system running on that device. You'll learn about touch sensors, light sensors, accelerometers, gyroscopes, magnetic sensors, as well as temperature, humidity, and gas sensors.

Vous avez envie de concevoir des montages avec Arduino ou Raspberry Pi qui interagissent avec leur environnement ? Pour cela vous avez besoin de capteurs, et cet ouvrage vous aidera à passer rapidement des idées à la réalisation.

Chaque chapitre est consacré à un type de capteur (mouvement, lumière, son, etc.) et comporte : des expériences qui expliquent la manière d'utiliser un capteur ; des tests de validation ; un mini-projet qui montre comment combiner différentes technologies pour obtenir un montage performant. Les nombreux

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exemples de code commentés vous seront précieux pour créer vos propres projets. Les montages que vous pourrez réaliser : un éthylotest personnel, un détecteur de fumée qui envoie un courriel d'alerte, une sonnette hantée qui sonne avant qu'on ne la touche, un jeu vidéo Pong, un dôme lumineux sensible à la couleur, un écran graphique qui réagit aux sons ambiants, une station météo... Le code source des programmes et de nombreux liens et références utiles sont disponibles sur [www.dunod.com/contenus-complementaires/9782100717934](http://www.dunod.com/contenus-complementaires/9782100717934) ainsi que sur [botbook.com](http://botbook.com), le site de référence de la version d'origine.

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

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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

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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,

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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

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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

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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

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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,



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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 may be measured with an 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

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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 CO<sub>2</sub> 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

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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 CO<sub>2</sub>) 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

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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

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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-

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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.

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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

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in cogeneration form converted to the required power using thermodynamic cycles (organic Rankin, Brayton cycle, micro turbine, Stirling) with an inverter and charge controller.

25 montages à réaliser avec Arduino Avec son petit microcontrôleur hautement performant et facilement programmable, la carte Arduino a révolutionné le mouvement Do It Yourself. Se couplant aisément avec d'autres composants (écrans LCD, capteurs, moteurs...), elle est devenue aujourd'hui un élément indispensable dans de nombreux dispositifs électroniques. Sa simplicité d'utilisation, l'étendue de ses applications et son prix modique ont conquis un large public d'amateurs et de professionnels : passionnés d'électronique, designers, ingénieurs, musiciens... Remarquable par son approche pédagogique, cet ouvrage de référence vous fera découvrir le formidable potentiel d'Arduino, en vous délivrant un peu de théorie et surtout beaucoup de pratique avec ses 25 montages à réaliser. Mise à jour avec les dernières évolutions d'Arduino, cette troisième édition entièrement refondue s'est enrichie de nouveaux projets à monter, qui font appel à une liaison Bluetooth, à Scratch, ou encore au module WI-FI ESP8266. À qui s'adresse ce livre ? Aux électroniciens, bricoleurs, bidouilleurs, hobbyistes, ingénieurs, designers, artistes, makers... Dans ce livre, vous apprendrez notamment à : créer un séquenceur de lumière fabriquer un



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afficheur LCD commander un moteur pas-à-pas concevoir un jeu de ping pong Sur [www.editions-eyrolles.com/dl/0067488](http://www.editions-eyrolles.com/dl/0067488) Téléchargez le code source des sketches Arduino présentés dans cet ouvrage. Électronicien de formation, Erik Bartmann est aujourd'hui développeur pour le principal fournisseur européen d'infrastructures informatiques. Passionné d'électronique depuis toujours, il est l'auteur de plusieurs ouvrages sur Arduino, Processing et le Raspberry Pi. Un peu de théorie, beaucoup de pratique ! Aujourd'hui, les réseaux informatiques sont partout : nous les utilisons au quotidien dans ce monde hyperconnecté où même les objets s'échangent des données (Internet des objets). Mais comment fonctionnent ces réseaux ? Comment partagent-ils des informations ? Comment peuvent-ils être reliés à des objets ? Sans aucun prérequis nécessaire, cet ouvrage vous fournira toutes les réponses à ces questions, au travers de petits projets amusants basés sur l'ESP32, une carte à microcontrôleur simple d'emploi et d'un prix modique. Muni d'un ordinateur, d'une tablette ou d'un smartphone, vous découvrirez ainsi comment distinguer les éléments constitutifs d'un réseau, le tester, identifier des périphériques, échanger des données en TCP, ou encore créer un serveur web. Vous serez également initié à l'Internet des objets en fabriquant votre propre objet connecté ! Avec ce livre ludique, vous apprendrez donc en pratiquant. À qui s'adresse ce

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livre ? Aux enseignants et élèves de collèges/lycées Aux associations, clubs d'électronique, bibliothèques...

L'anthropotechnologie concentre ses actions depuis trente ans sur l'étude et l'amélioration des conditions de travail et de vie des populations à travers le monde. Elle oriente les acteurs des processus de conception en les rendant attentifs au « facteur humain », à ses composantes sociales, culturelles et environnementales. Elle valorise par conséquent une conception des techniques respectueuse des personnes, de leurs manières de penser et d'agir dans des contextes spécifiques. Cet ouvrage relate l'évolution et l'institutionnalisation récente de cette discipline dans le monde de l'Université et des Hautes Ecoles. Des projets sont présentés et les dynamiques de coconception sont analysées. Toujours soucieuses de répondre aux contextes du terrain, ces dynamiques fédèrent des ensembles de compétences souvent antagonistes.

Ce cahier d'activités permet l'acquisition de techniques d'analyse et de programmation autour de dix projets ludiques. Pour les 4e, il propose une initiation au code informatique pour créer des jeux simples avec des solutions ergonomiques (Scratch, Proglab...) ou des langages plus pointus (Python, JavaScript). En 3e, les élèves apprennent à programmer le comportement d'objets connectés : robot, drones de surveillance et même micro-contrôleur

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Arduino. > Codez de A à Z > Programmer un drone > Programmer une station météo

La société 5.0 est une mutation sociale importante. Elle fait suite à la naissance de technologies qui sont devenues matures et ont été diffusées dans des temps records. Ainsi, en 1998, Kodak, leader mondial du film, avait 170 000 employés. Il paraissait alors impensable que 3 ans plus tard, la majorité des gens ne prendrait plus jamais d'images sur du papier film et que Kodak aurait disparu. Tels sont les enjeux de cette nouvelle société qui se dessine. Cet ouvrage, qui ne se veut pas un antimanuel de politique, de management ou de marketing de la technologie, cherche à la fois à lutter contre les excès de cette société 5.0 souvent mal comprise, et à faire le pari de présenter les idées qui la composent, ainsi que les technologies associées, toutes oeuvrant pour l'amélioration sociétale. Parmi ces technologies, l'intelligence artificielle, la robotique, les plateformes numériques et l'impression 3D sont assurément les plus importantes.

Processing est un langage de programmation dédié à la production artistique. Grâce à ses nombreux modules additionnels, il ne se limite pas à la création visuelle et peut communiquer avec des dispositifs électroniques de type Arduino et manipuler du son, de la vidéo, etc. Cet ouvrage tient compte des nouveautés

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introduites par la version Processing 3 qui est sortie fin 2015. Cet ouvrage d'initiation a été conçu pour : les créateurs qui veulent produire des installations interactives à l'aide de périphériques tels que souris, caméra, capteur de mouvements, ou bien encore en association avec une carte de prototypage Arduino. les graphistes qui pourront générer des motifs, des visuels ou des data-visualisations programmées, fixes, animées ou interactives. et tous ceux qui veulent s'initier à la programmation car Processing qui est un langage à la fois simple, puissant et bien conçu est un excellent outil d'initiation à l'écriture de code informatique.

Les capteurs pour Arduino et Raspberry Pi Tutoriels et projets Dunod  
WikiPlaza presents a practical and theoretical research in the field of the participatory social construction of public space mediated by information and communication technologies. The work aims to condense the experiences of free software and hacker culture, and the social and independent media movements that emerged at the turn of the twenty-first century, in order to produce "ecosophic machines," that is, new technical, social and mental ecologies that offer an alternative to the dominant neoliberalism and promote and stimulate emancipation, autonomy and spaces of the commons. The subtitle Request For Comments is our small homage to the pioneers of the Internet, and points to the

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fact that the wikiplaza project is a work in progress, open to anybody who wants to question, use or change it, or to create new versions.

La fabrication numérique pour tous Si les imprimantes 3D demeurent incontestablement les vedettes des Fab Labs, il existe beaucoup d'autres machines à commande numérique tout aussi indispensables pour les makers : découpeuses laser ou vinyle, fraiseuses à bois ou à métal, découpeuses au jet d'eau ou au plasma, machines à broder... Cet ouvrage très illustré dresse un panorama de toutes ces machines en détaillant leurs origines, principe de fonctionnement, pilotage, typologie, applications grand public et industrielles. Émaillé de différents portraits de makers, ce guide pratique fournit aussi une multitude d'infos pour fabriquer soi-même sa machine, afin de rendre la fabrication numérique accessible à tous. À qui s'adresse ce livre ? Aux makers, bricoleurs, designers, artisans, geeks... Aux usagers des Fab Labs, makerspaces, etc. Préfaces de Neil Gershenfeld (créateur du concept de Fab Lab) et Mickaël Desmoulins (président de l'association Fab&Co)

Le langage Java et le nano-ordinateur Raspberry Pi sont deux outils incroyablement populaires et pédagogiques dans le monde des technologies actuelles. Cet ouvrage les réunit, dans le but de vous apprendre à programmer en Java en réalisant différents projets simples d'électronique avec un Raspberry

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Pi 3 (modèles B, B+, A+ et Zero WH). Le livre débute par l'installation et l'utilisation de l'environnement de développement Eclipse pour Java, puis présente le port GPIO du Raspberry Pi, en s'aidant des schémas produits par Fritzing. Il utilise ensuite des scripts Python pour tester des composants montés sur une platine de test. L'apprentissage de Java s'effectue en douceur à l'aide de la librairie Pi4J qui gère le port GPIO : d'abord avec des LED, puis en utilisant un relais et différents capteurs (de mouvement, lumière, température...). Vous apprendrez aussi à programmer un serveur web en Java grâce à l'accès Wi-Fi du Raspberry Pi. Enfin, vous manipulerez une base de données SQLite avant de réaliser le projet final : l'envoi d'un e-mail depuis le Raspberry Pi avec la photo de l'intrus entré dans votre logement ! Ce livre d'une grande richesse de contenu est complété par 120 exercices corrigés, dont les solutions sont disponibles en ligne. À qui s'adresse ce livre ? Aux débutants en programmation Java Aux amateurs d'électronique souhaitant programmer en Java Aux étudiants et aux makers Entièrement révisé pour le nouvel Arduino Uno R3, ce livre, traduction du best seller américain sur le sujet, explique comment rédiger des programmes en utilisant le langage C modifié pour Arduino. Vous apprendrez à configurer le matériel et les logiciels, à développer vos propres programmes, à travailler avec des bibliothèques Arduino personnalisées et intégrées et à explorer l'Internet des

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objets, le tout sans aucune expérience préalable en programmation ! Le gourou de l'électronique, Simon Monk, traite de tous les concepts et de la syntaxe selon un langage simple et donne des instructions claires conçues pour tout débutant. Programmer Arduino contient des dizaines d'exemples simples à suivre et d'illustrations de haute qualité. Tous les exemples présentés dans le livre peuvent être utilisés tels quels ou modifiés pour répondre à vos besoins. Vous avez envie de concevoir des montages avec Arduino ou Raspberry Pi qui interagissent avec leur environnement ? Pour cela vous avez besoin de capteurs, et cet ouvrage vous aidera à passer rapidement des idées à la réalisation. Chaque chapitre est consacré à un type de capteur (mouvement, lumière, son, etc.) et comporte : des expériences qui expliquent la manière d'utiliser un capteur ; des tests de validation ; un mini-projet qui montre comment combiner différentes technologies pour obtenir un montage performant. Les nombreux exemples de code commentés vous seront précieux pour créer vos propres projets. Les montages que vous pourrez réaliser : un éthylotest personnel, un détecteur de fumée qui envoie un courriel d'alerte, une sonnette hantée qui sonne avant qu'on ne la touche, un jeu vidéo Pong, un dôme lumineux sensible à la couleur, un écran graphique qui réagit aux sons ambiants, une station météo... La carte électronique Arduino permet de créer des montages ayant un intérêt à la

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fois : • pour l'élève, afin de découvrir les bases de la programmation, d'utiliser les TICE, d'apprendre par la pratique ; • et pour l'enseignant, qui peut ainsi créer ses propres dispositifs d'acquisition : la carte Arduino est un système peu onéreux, simple d'utilisation et dont les schémas sont publiés sous licence libre. Ce guide vous propose 50 manipulations pédagogiques à réaliser avec Arduino, réparties selon 10 thématiques et débutant par des montages simples (abordables dès la 4e) pour aboutir à des dispositifs plus complexes (niveau post-bac) et utiles au quotidien (arrosage automatique, serre domotique...). Les applications possibles avec la carte Arduino dépassent le cadre de la programmation. Ainsi, certaines expériences présentées permettent d'étudier des phénomènes physiques autrement et pouvant également être abordés en mathématiques, en biologie-écologie, en agronomie, en agro-équipement, avec les TIM de manière transversale et pluridisciplinaire. Chaque fiche présente les objectifs de la manipulation, le schéma de câblage, la liste du matériel nécessaire, le script, ainsi que des pistes d'applications pédagogiques permettant de contextualiser le montage en fonction de la filière et du niveau d'enseignement. Les points forts • 50 manipulations séquencées en 10 thématiques (capteurs, traitement des données, objets connectés...) • une progression pour aborder les montages les plus simples (dès la 4e) aux plus



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complexes • la liste du matériel • les schémas de câblage • les scripts • des pistes d'applications pédagogiques En complément, un site compagnon avec : • les schémas en couleur téléchargeables • les scripts en couleur et au format texte téléchargeables • une vidéo présentant une manipulation avec une application Android

À l'action avec Arduino et Raspberry Pi ! Cet ouvrage à vocation pratique explique comme créer et contrôler des mouvements, de la lumière et du son à l'aide d'un Arduino et d'un Raspberry Pi. Avec à l'appui 30 projets ludiques à réaliser, il détaille comment utiliser ces deux plates-formes pour contrôler des LED, des moteurs de divers types, des bobines, des dispositifs à courant alternatif, des pompes, ou encore des systèmes d'affichage ou de production de sons. Il se clôt par des projets permettant de contrôler des mécanismes et des systèmes avec Internet, faisant ainsi pénétrer le lecteur dans le monde des objets connectés. Le maker, qui aura déjà eu l'occasion d'utiliser un Arduino ou un Raspberry Pi pour mesurer le monde réel à l'aide de capteurs, passera ici à l'action en découvrant les bases de l'automatisation. À qui s'adresse ce livre ? Aux makers, amateurs d'électronique, bricoleurs, bidouilleurs... Dans ce livre, vous apprendrez notamment à : créer un système d'arrosage automatique de vos plantes avec Arduino mettre au point un rafraîchisseur de boissons fabriquer

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une marionnette qui danse en fonction de vos tweets concevoir un éclateur aléatoire de ballon Sur [www.serialmakers.com](http://www.serialmakers.com) Téléchargez le code source des programmes Arduino et Raspberry Pi présentés dans cet ouvrage.

Arduino est un outil économique et parfaitement adapté pour réaliser soi-même des applications domotiques telles que la régulation à distance du chauffage ou de l'éclairage, l'ouverture et la fermeture de portes ou de volets, la télésurveillance, l'arrosage en fonction de l'humidité, etc. Cet ouvrage est un guide pas-à-pas de projets concrets avec des exemples de code, des schémas et des photos pédagogiques. Il se termine par une introduction à l'impression 3D pour réaliser soi-même les boîtiers dans lesquels encastrent circuits et capteurs. Toutes les matières des nouveaux programmes de Seconde en un seul ouvrage : français, maths, sciences numériques et technologie, histoire-géo, EMC, physique-chimie, SVT, anglais, espagnol, SES. Pour réussir sa 2de et préparer son passage en 1re. Sur chaque thème du programme, dans chaque discipline • L'essentiel du cours • La méthode ou le document clé • Un entraînement progressif : quiz, exercices d'application • Les corrigés détaillés de tous les exercices En accès gratuit, avec l'achat du livre, sur le site [www.annabac.com](http://www.annabac.com) • Des parcours de révision interactifs proposant, pour chaque thème du programme : des fiches, des quiz, des exercices et sujets corrigés • Des conseils

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pour bien s'orienter

Apprenez à créer vos premiers programmes créatifs avec Arduino ! Fonctionnant comme un livre de recettes créatives, cet ouvrage vous apprendra à créer des projets de toutes sortes avec Arduino. Ce livre permet aussi de revoir les bases et l'histoire d'Arduino, à comprendre le matériel et ses principes de fonctionnement. Vous apprendrez à utiliser divers capteurs et composants utiles au développement de vos projets. Vous pourrez ainsi programmer : De petits éléments de domotique ; Un stroboscope ; Un dessous de verre interactif ; La création d'instruments de musique (theremin, synthétiseur laser), et d'une pédale d'effet pour la guitare ; Une plante qui twitte son état (chaud, soif), et s'auto arrose selon l'heure ; Un compteur Geiger pour mesurer la radioactivité ; Un bras articulé, robot quadripode etc.

Les défis de l'automatisation des systèmes sociotechniques sont fortement liés à la prise en compte des atouts et des limites des ressources techniques et humaines, tels que les caractéristiques perceptives, les capacités coopératives, les modalités de partage de tâches, la modélisation de comportements humains, ou l'apport de démarches de conception innovante. Défis de l'automatisation des systèmes sociotechniques expose la difficulté à mettre en oeuvre et à garantir, à court, moyen et long termes, une symbiose entre humains et

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machines. Il présente des solutions innovantes pour la réalisation d'une telle symbiose, qui nécessitent des compétences à la fois en sciences cognitives, sciences pour l'ingénieur et sciences sociales. Les chercheurs, enseignants-chercheurs ou les ingénieurs de ces domaines trouveront dans cet ouvrage des éléments de réponses à ces défis permanents.

Make cool stuff. If you're a designer or artist without a lot of programming experience, this book will teach you to work with 2D and 3D graphics, sound, physical interaction, and electronic circuitry to create all sorts of interesting and compelling experiences -- online and off. Programming Interactivity explains programming and electrical engineering basics, and introduces three freely available tools created specifically for artists and designers: Processing, a Java-based programming language and environment for building projects on the desktop, Web, or mobile phones Arduino, a system that integrates a microcomputer prototyping board, IDE, and programming language for creating your own hardware and controls OpenFrameworks, a coding framework simplified for designers and artists, using the powerful C++ programming language BTW, you don't have to wait until you finish the book to actually make something. You'll get working code samples you can use right away, along with the background and technical information you need to design, program, build,

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and troubleshoot your own projects. The cutting edge design techniques and discussions with leading artists and designers will give you the tools and inspiration to let your imagination take flight.

NFC is a world standard since 2004 which is now within every smartphone on the market. Such a standard enables us to do mobile transactions (mobile payment) in a secure way along with many other information- based tap'n play operations. This book has a double role for computer scientists (from bachelor students in CS to IT professionals).

En géographie, l'étude de l'environnement représente un large champ scientifique qui couvre les dimensions biophysiques de la nature, les dimensions sociales associées au cadre de vie des individus et leurs interactions complexes et hybridées dans la construction des questions environnementales contemporaines. Cet ouvrage propose un panorama actualisé des concepts, des méthodes et d'exemples emblématiques (thèmes, objets, pratiques) d'une approche biophysique de l'environnement en géographie. Il vient également mettre en évidence l'apport d'une telle approche dans la compréhension et la gestion des enjeux environnementaux (aide à la décision, production d'indicateurs, rôle politique de l'expertise...). Un ouvrage assorti d'une cinquantaine de cartes originales

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D'abord, on pratique, ensuite on explique ! L'électronique ne se résume pas qu'à des résistances, des condensateurs, des transistors et des diodes. Savez-vous qu'il existe une infinité de projets faisant appel à des comparateurs, des amplis-op ou encore des capteurs ? Après le best-seller L'électronique en pratique de Charles Platt, lisez la suite du même auteur pour vous en convaincre. Grâce à 36 nouvelles expériences, cet ouvrage vous emmènera à la découverte d'une multitude de composants : amplis-op, comparateurs, compteurs, encodeurs, décodeurs, multiplexeurs, registres à décalage, bargraphes, timers, réseaux Darlington, phototransistors... À qui s'adresse ce livre ? Aux électroniciens en herbe, amateurs, bricoleurs, bidouilleurs, geeks, étudiants, musiciens... À tous les makers qui souhaitent approfondir leurs connaissances en électronique. Dans ce livre, vous apprendrez à : mettre au point un testeur de télépathie avec des portes NAND, NOR et XNOR construire un contestataire de bruit avec des amplis-op et des condensateurs de liaison créer une version électronique du YiJing avec un décodeur et un compteur binaire fabriquer un jeu de la fente magique avec un timer, un compteur et un multiplexeur

Pour devenir maker, vous avez seulement besoin de rêver de construire quelque chose qui rend le monde meilleur... ou tout simplement quelque chose d'utile dans votre quotidien. Ce livre est le guide qu'il vous faut : pratique et complet, il

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fera de vous le héros de la nouvelle révolution industrielle. Il montre comment transformer vos idées en projets concrets en utilisant les techniques d'aujourd'hui comme le prototypage, l'impression 3D et la programmation. Grâce à des explications claires et précises, ce livre vous aidera à libérer votre créativité en concrétisant vos projets.

This book details Solar-Tracking, Automatic Sun-Tracking-Systems and Solar-Trackers. Book and literature review is ideal for sun and moon tracking in solar applications for sun-rich countries such as the USA, Spain, Portugal, Mediterranean, Italy, Greece, Mexico, Portugal, China, India, Brazil, Chili, Argentina, South America, UAE, Saudi Arabia, Middle East, Iran, Iraq, etc. A solar tracker is a device that orients a payload toward the sun. Like a satellite tracker or moon tracker, it tracks the celestial object in the sky on its orbital path of apparent movement. A 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

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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. 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 solar tracking is quite simple, even if you are a novice, but mathematical solar



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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

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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

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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

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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++, 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

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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, Ecam 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), Xeon, Atmel megaAVR, 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

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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 may be measured with an 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

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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

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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 CO<sub>2</sub>) 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 and Simulink 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



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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

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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

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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



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Arduino constitue un excellent moyen de faire ses premiers pas sans connaissances préalables en électronique numérique. Si vous êtes plutôt du genre ingénieur ou inventeur et que vous souhaitez vous servir d'Arduino pour développer des projets innovants, il va vous falloir creuser davantage le sujet. Ce guide complet unique en son genre explore justement cette plate-forme de prototypage électronique open source sous tous ses aspects, aussi bien internes qu'externes. Comme aucun mode d'emploi n'est fourni avec une carte Arduino, l'auteur de ce livre, expert en systèmes embarqués, a réuni ici toutes les informations et connaissances qu'il a pu recenser ou acquérir au cours de ses nombreux projets. Tout est abordé : les microcontrôleurs AVR, les outils de la chaîne de compilation, l'amorceur bootloader, les bibliothèques de fonctions

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essentielles, les cartes boucliers, les modules et les composants capteurs et actionneurs. Ce livre propose en outre quatre projets professionnels dont vous pourrez vous inspirer pour vos propres applications. Caractéristiques physiques et brochage des entrées-sorties des cartes Arduino. Microcontrôleurs Arduino AVR embarqués dans les cartes Arduino. Atelier Arduino de développement de croquis. Programmer pour Arduino sans l'atelier Arduino. Familles de boucliers d'acquisition de données (communication, mémoire, Bluetooth, relais, etc.). Familles de capteurs, modules, claviers, afficheurs et actionneurs pour Arduino. Techniques pour créer votre propre bouclier compatible. Analyse des besoins et conception d'un jeu d'exigences testables pour garantir la réussite d'un projet.

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 mechanic 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

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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.

This book describes important methodologies, tools and techniques from the fields of artificial intelligence, basically those which are based on relevant conceptual and formal development. The coverage is wide, ranging from machine learning to the use of data on the Semantic Web, with many new topics. The contributions are concerned with machine learning, big data, data processing

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in medicine, similarity processing in ontologies, semantic image analysis, as well as many applications including the use of machine learning techniques for cloud security, artificial intelligence techniques for detecting COVID-19, the Internet of things, etc. The book is meant to be a very important and useful source of information for researchers and doctoral students in data analysis, Semantic Web, big data, machine learning, computer engineering and related disciplines, as well as for postgraduate students who want to integrate the doctoral cycle. Les humanités numériques constituent un champ mouvant incluant recherche, enseignement, études et pratiques. L'objectif est ici de comprendre les implications et les opportunités du numérique comme un média, un objet d'étude, voire un véritable écosystème. Les sciences humaines et sociales (SHS) semblent aujourd'hui bouleversées, tant au plan épistémologique que méthodologique, par les outils numériques qui permettent d'analyser des données à la fois hétérogènes et volumineuses. Quant aux sciences de l'information et de la communication (SIC), elles analysent, grâce à leur réflexion critique sur la genèse du numérique, l'impact de ce dernier sur le processus de production des données et de leur interprétation. Les questions récurrentes posées par les SHS demeurent centrales pour saisir la complexité infocommunicationnelle et dépasser une approche strictement computationnelle.

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Cet ouvrage regroupe l'ensemble des communications de la conférence internationale H2PTM'19 : de l'hypertexte aux humanités numériques. Petit mais costaud ! Avec plus de deux millions d'exemplaires écoulés en moins de deux ans, le Raspberry Pi est incontestablement le roi des nano-ordinateurs. De la taille d'une carte de crédit, sans écran ni clavier, et d'un prix modique, il s'avère pourtant suffisamment puissant et ouvert pour offrir une grande variété d'applications : robot, station météo, serveur web, média center, PC de bureau... Cet ouvrage vous permettra d'appréhender le formidable potentiel de cet ordinateur, avec à la clé de petits programmes et des projets simples à réaliser. Vous serez ainsi amené à coder en Python et en Scratch, à manipuler des sons et des images avec Pygame, à communiquer via les broches d'entrées-sorties, à intégrer des périphériques, et beaucoup d'autres choses encore. A qui s'adresse ce livre ? Aux makers, développeurs, électroniciens, hackers, designers, bricoleurs, bidouilleurs, artistes... Aux amateurs comme aux professionnels Sur [www.serialmakers.com](http://www.serialmakers.com) Téléchargez le code source des exemples de l'ouvrage Consultez les compléments (liens utiles, news, etc.)

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

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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](http://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

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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

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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,

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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



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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

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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

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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 can be measured with an 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 CO<sub>2</sub> 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

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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

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polygeneration, solar trigeneration (solar triple generation), and solar quad generation (adding delivery of steam, liquid/gaseous fuel, or capture food-grade CO<sub>2</sub>) 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

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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

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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.

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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 Rankin, Brayton cycle, micro turbine, Stirling) with an inverter and charge controller. ? ????? ?????????





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Pars à la découverte d'Arduino ! Amusant et facile à lire, ce livre te fera découvrir l'électronique et surtout le formidable potentiel d'Arduino, un petit microcontrôleur programmable qui permet de réaliser plein de projets ludiques. Avec des composants simples, du carton et de la colle, tu seras guidé dans la mise en oeuvre de montages de difficulté croissante, allant d'un panneau d'affichage de LED à un jeu de labyrinthe à bille. Combinant avec intelligence théorie et pratique, cet ouvrage fera de toi un pro d'Arduino et des circuits électroniques. Dans notre société toujours plus numérique, cela te donnera un super avantage pour la suite de ton parcours scolaire. Dans ce livre, tu fabriqueras : un carillon a vent électronique un mini coffre-fort à combinaison une

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boule de cristal qui s'illumine par magie un labyrinthe à bille qui mémorise ton score un affichage lumineux sur la manche d'un vêtement et bien d'autres projets ! A qui s'adresse cet ouvrage ? Aux 10-15 ans, parents et enseignants. Sur [www.editions-eyrolles.com/go/arduino](http://www.editions-eyrolles.com/go/arduino) Télécharge toutes les ressources (code source, vidéos) du livre.

De trop nombreux électroniciens considèrent les microcontrôleurs avec une certaine réticence compte tenu des difficultés d'apprentissage de leur langage et de leur mise en oeuvre. En lisant les 260 pages de ce livre vous éprouverez une certaine aisance et beaucoup de plaisir à travailler avec les célèbres modules ARDUINO. Vous apprécierez leur facilité de programmation en langage visuel grâce au logiciel "ARDUBLOCK", étroitement associé à l'interface habituelle, sans installation. La suite logicielle portable : "ARDUINO AUGMENTÉ", outil essentiel de ce livre, se télécharge librement et intègre tous les logiciels et librairies nécessaires. Développée par la société "DuinoEDU®", elle peut même s'utiliser à partir d'une clé USB. Avec les modules ARDUINO vous n'aurez pratiquement plus à modifier la section électronique d'une réalisation lors de la mise au point d'un projet. Il suffit simplement de changer quelques blocs graphiques afin de parvenir au résultat escompté. Nous avons opté pour les modules ARDUINO compte tenu de leur faible coût, de leur popularité et de leur grande puissance de traitement. Ce livre, largement illustré en couleur, démontre que la programmation visuelle ne s'adresse pas essentiellement aux novices. Elle

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simplifie la manière de programmer, comme autrefois le passage du langage machine au "Basic", au "Pascal" et autre "C", "C++", etc. Beaucoup d'automates industriels se programment d'ailleurs en langage visuel ! Ce livre convient donc autant aux novices qu'aux lecteurs initiés. Après les projets simples, nous aborderons les projets connectés mettant en oeuvre les communications Bluetooth et Wi-Fi. Vous apprendrez à traiter de multiples circuits et périphériques : entrées numériques et analogiques, sorties faibles et fortes puissances, afficheur LCD alphanumérique, sonde de température, gestion des servomoteurs, télécommande par infrarouge, composants I2C, etc. Vous programmerez visuellement les applications de votre Smartphone. Enfin, n'oublions pas qu'un ouvrage d'électronique se doit de proposer des réalisations complètes, avec circuits imprimés. Ce livre ne déroge pas à cette règle avec la conception de modules capteurs, actionneurs, d'interfaces ainsi que des montages complets en robotique et domotique. Le livre que vous devez posséder pour créer et faire aboutir tous vos rêves électroniques !

Le prototypage est une étape indispensable dans tout processus de création : il permet d'éprouver un design, de valider ou de préciser des choix ergonomiques, techniques et esthétiques, ou encore d'anticiper les éventuels problèmes de production. À ce titre, les prototypes physiques, qui autorisent des manipulations inconcevables sur écran, restent incontournables. Complet et didactique, cet ouvrage s'articule autour de 21 chapitres : Les chapitres 1 à 6 présentent les usages d'un prototype, l'aménagement

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d'un atelier et l'équipement, en proposant diverses études de cas élaborées par des designers de renom, et insistent sur les questions d'hygiène et de sécurité. Les chapitres 7 à 11 abordent les techniques (fabrication additive ou soustractive, moulage, collage...) et les outils de prototypage, tout en soulignant la complémentarité des méthodes numériques et manuelles. Les chapitres 12 à 21 sont consacrés à la fabrication de maquettes dans les matériaux usuels : papier, carton-mousse, plastique, argile, bois, textile... De nombreux tutoriels, conçus sur mesure, détaillent les étapes à suivre. Publié pour la première fois en français à l'occasion de son actualisation, ce livre de référence se destine aux étudiants et aux professionnels du design produit. Comment ne pas avoir peur et garder le plaisir d'entreprendre dans le monde actuel ? Comment profiter des mutations actuelles ? Comment concilier efficacité économique et innovation sociale ? Comment saisir les opportunités issues des NBIC ? Qu'est-ce qu'un management fondé sur la confiance et la responsabilité ? Comment réinventer l'entreprise de l'intérieur ? 3 000 dirigeants se sont réunis lors de la Convention des clubs Apm en octobre 2013 pour échanger sur le sens de leur métier, sur l'avenir de leur entreprise et sur les personnes qui la composent. Ce livre en est l'émanation. Autant de questions sur lesquelles une cinquantaine d'"experts" Apm (Association Progrès du Management) se penchent dans cet ouvrage. Chefs d'entreprise, universitaires, économistes, philosophes, managers, journalistes... Tous livrent leurs analyses, pistes de réflexion et d'action vers un nouveau mode de management.

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Théorie et pratique - grâce à des "repères pour l'action" - cohabitent dans ce livre riche et foisonnant qui renouvellera votre vision du management !

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