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Department Vision

Department of Computer Science and Engineering aspires to become a center of excellence for quality technical education by keeping pace with new technologies to create competent professionals.

Department Mission

M1: To develop professionals with analytical and technical competency for productive career in industry, academia and as entrepreneurs.
M2: To build theoretical and applied skills of faculty and student in computer science and engineering through need based training, research and development on industrially and socially relevant issues.
M3: Continuously improve and provide state-of-the-art laboratories to keep up with the new developments in the area of computer science and engineering.
M4: Create nurturing environment through competitive events, industry interactions, global collaborations and creating concern for lifelong learning.

About Department

PIET-CSE aims to encourage research and innovation in Computer Science and allied areas. The objective of the BTech program in Computer Science and Engineering (CSE) is to prepare students to undertake careers involving innovation and problem solving using computational techniques and technologies, or to undertake advanced studies for research careers or to take up Entrepreneurship.

In order to give due importance to applied as well as theoretical aspects of computing, the curriculum for the BTech (CSE) program covers most of the foundational aspects of computing sciences, and also develops in students the engineering skills for problem solving using computing sciences.

Most engineering programs start with general courses in Sciences, and then migrate to specialized courses for the disciplines. While these courses are indeed foundational for many engineering disciplines, they can be treated as application domains (as is evidenced from the fact that most sciences and Engineering disciplines heavily use computing now) Hence, the BTech (CSE) program at PIET starts with computing oriented courses first, and allows the possibility of doing science courses later. Besides being better suited for a CSE program, it also enables the possibility of students seeing newer applications and possibilities of using computing in these subjects.

PROGRAM EDUCATIONAL OUTCOMES (PEOS)

PEO1

- To impart an in-depth knowledge of science, mathematics, and computer science and engineering to create a foundation for building capacity and competence in using the fundamental and core knowledge.

PEO2

- To facilitate and foster technical and analytical skills in students to develop innovative solutions to complex real life problems using existing and novel technologies.

PEO3

- To train students with the relevant soft skills and also with a concern for lifelong learning.

PEO4

- To expose them to various contemporary and social issues which will enable them become ethical and responsible citizens of the society.

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MESSAGE

DIRECTOR's MESSAGE

Professor (Dr) Shakti Kumar
(Director)

It gives me immense pleasure to pen a few words as prologue to the half yearly technical magazine COMPUTECHIE exclusively meant for churning out the latent writing talent which bears immense potentially of sharpening the students skills as part of their overall personality development .I congratulate all the contributors for bringing out such a beautiful magazine.

PANIPAT INSTITUTE OF ENGINEERING & TECHNOLOGY

MESSAGE

HOD's MESSAGE

Dr. S. C. Gupta
Professor and HOD, Department of Computer Science and Engineering

It is a occasion of great pride and satisfaction for the department of CSE, PIET to bring out the issue of the half yearly of the Technical magazine COMPUTECHIE. It gives me immense pleasure to note that the response to the magazine has been overwhelming .The wide spectrum of articles gives us a sense of pride that our students and faculty possess creative potential and original thinking in ample measures. Each article is entertaining interesting and absorbing .I applaud the contributors for their stimulated thoughts and varied hues in articles contributed by them.

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FACULTY ARTICLES

Parallel programming & its need for cryptographic algorithms

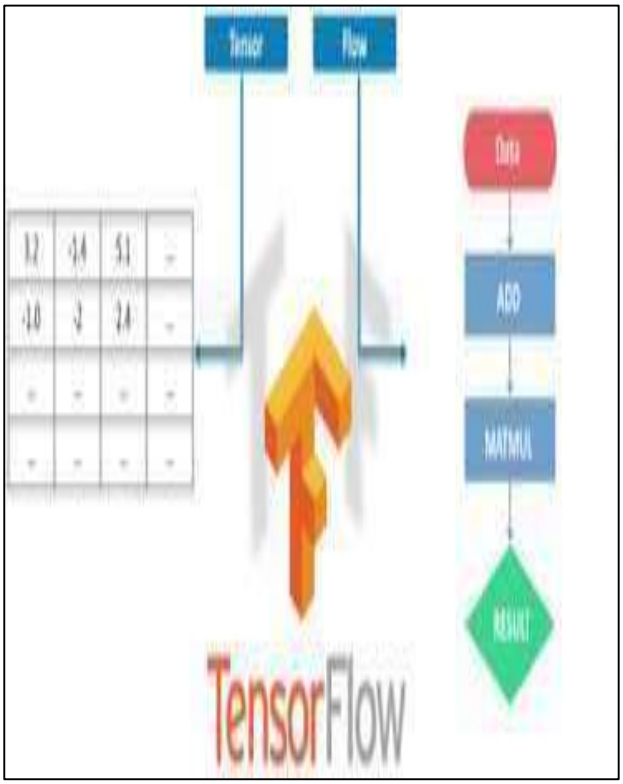
Parallel programming model is an abstraction of the computer system architecture. Therefore, it is not tied to any specific machine type. However, there are many possible models for parallel computing because of the different ways several processor can be put together to build a parallel system. Two approaches have become predominant in the HPC parallel programming landscape: OpenMP for shared memory and MPI for distributed memory. OpenMP is a shared memory application programming interface (API) whose aim is to ease shared memory parallel programming. It supports the so-called fork-join programming model. In this approach, the program starts as a single thread of execution, just like a sequential program. The thread that executes this code is referred to as the initial thread. Whenever an OpenMP parallel construct is encountered by a thread while it is executing the program, it creates a team of threads (this is the fork), becomes the master of the team, and collaborates with the other members of the team to execute the code dynamically enclosed by the construct. Portability of OpenMP across shared memory architectures is one of the advantages that is undeniable. Cryptography provides techniques for information authenticity, confidentiality and integrity, but at the same time implementing cryptographic algorithm involves challenges such as speed of execution, processor and memory requirements. Shared memory implementation of cryptographic algorithms exploiting the immense computational power provided by modern multicore architecture improves the performance of these algorithms.

Gourav Gambhir
(Assistant professor)

FACULTY ARTICLES

TensorFlow: The Android of AI

Tensor Flow is a library of files that allows researchers and computer scientists to build systems that break down data, like photos or voice recordings, and have the computer make future decisions based on that information. This is the basis of machine learning: computers understanding data, and then using it to make decisions. When scaled to be very complex, machine learning is a stab at making computers smarter.



Here are the details: the TensorFlow system uses data flow graphs. In this system, data with multiple dimensions (values) are passed along from mathematical computation to mathematical computation. Those complex bits of data are called tensors. The math-y bits are called nodes, and the way the data changes from node to node tells the overall system relationships in the data. These tensors flow through the graph of nodes, and that's where the name TensorFlow comes from.

Open-sourcing Tensor Flow allows researchers and even grad students the opportunity to work with professionally-built software, sure, but the real effect is the potential to inform every machine learning company's research across the board. Now organizations of all sizes—from small startups to huge companies on par with Google—can take the TensorFlow system, adapt it to their own needs, and use it to compete directly against Google itself.

Harish Saini
(Assistant Professor)

FACULTY ARTICLES

Strong Encryption Scheme For HDFS in Big Data

Due to rapid development of internet and web applications, the prominence and the importance of the information exchange using the internet is growing. Communication through internet faces data safety as an important issue. Data has to be safe when communicating as slightly loss or danger to transmitted data can be responsible for excessive harm to the society. For network safety encryption plays a vibrant part. Many times it is little bit confusing to choose best encryption, as there are many cryptography methods for securing the text, images and media files

Data during transmission. For many applications Blowfish is currently assumed to be insecure. So it turns out to be essential to enhance this procedure through addition of different levels of safety so that it can be used in several reliable communication channels. Blowfish algorithm is modified in a way that it is platform independent; however the present encryption schemes are restricted to platform dependent proposal. This proposed modified blowfish algorithm supports

Shally Chawla
(Assistant Professor)

STUDENT'S ARTICLES

Internet Of Things(I.O.T)

Technology has been growing so exponentially over recent years, there has been a steadily increasing demand for bright graduates to come in and help to transform areas ranging from data infrastructure to cyber security. If you are interested in pursuing a career in computer science, it's important to stay up to date with the latest trends in computer science research.
Latest computer science technology is storming the tech industry in which Internet of Things (IoT) is transforming the competitive landscape. As the world becomes increasingly connected, digitalization is a key differentiator that will enable companies to remain competitive. The internet of things (IoT) is a computing concept that describes the idea of everyday physical objects being connected to the internet and being able to identify themselves to other devices. The term is closely identified with RFID as the method of communication, although it also may include other sensor technologies, wireless technologies or QR codes.
A research article mentioning the Internet of Things was submitted to the conference for Nordic Researchers in Norway, in June 2002, which was preceded by an article published in Finnish in January 2002. The implementation described there was developed by Kary Främling and his team at Helsinki University of Technology and more closely matches the modern one, i.e. an information system infrastructure for implementing smart, connected objects.
Internet of things has evolved due to the convergence of multiple technologies, real-time analytics, machine learning, commodity sensors, and embedded systems. Traditional fields of embedded systems, wireless sensor networks, control systems, automation (including home and building automation), and others all contribute to enabling the Internet of things .
IoT platforms can help organizations reduce cost through improved process efficiency, asset utilization and productivity. With improved tracking of devices/objects using sensors and connectivity, they can benefit from real-time insights and analytics, which would help them make smarter decisions. The growth and convergence of data, processes and things on the internet would make such connections more relevant and important, creating more opportunities for people, businesses and industries.
Conversations about the IoT are (and have been for several years) taking place all over the world as we seek to understand how this will impact our lives. We are also trying to understand what the many opportunities and challenges are going to be as more and more devices start to join the IoT. The conclusion for this is that we can do is educate ourselves about what the IoT is and the potential impacts that can be seen on how we work and live.

-Kunal Jain
(B. Tech, 3rd year)

STUDENT'S ARTICLES

CYBER SECURITY

THE SECURITY BREACHES NO ONE IS TALKING ABOUT…

In late August, there was a report that Dairy Queen was the latest victim of a security breach affecting credit and debit cards. Except nobody from Dairy Queen has actually confirmed the breach, saying because the stores are franchised and franchises aren't required to report security problems, there is no way of knowing for sure. The speculation comes, according to security, from financial institutions that are reporting signs of credit card fraud.

This particular story goes to show that even when we think we know about a data breach we don't know the whole story. And there is good chance that before it is ever confirmed, it will join a very long list of breaches that don't get the publication they deserve. And these aren't necessarily breaches happening to small mom and pop business. For example, when the target breach happened last year, it not only headlined the news, it's also remained a news story for months. Every today, nearly a year later, the target breach is regularly referenced in data breach stories. But around the same time of the target breach, word came of the similar beach at Niemen Marcus. It was a story for a moment, and then disappeared.

-Diksha (2818032)
(B. Tech, 3rd year)

STUDENT'S ARTICLES

Block Chain Technology

Blockchain (BC), the technology behind the Bitcoin crypto-currency system, is considered to be both alluring and critical for ensuring enhanced security and (in some implementations, non-traceable) privacy for diverse applications in many other domains - including in the Internet of Things (IoT) eco-system. Intensive research is currently being conducted in both academia and industry applying the Blockchain technology in multifarious applications. Proof-of-Work (PoW), a cryptographic puzzle, plays a vital role in ensuring BC security by maintaining a digital ledger of transactions, which is considered to be incorruptible.

Furthermore, BC uses a changeable Public Key (PK) to record the users' identity, which provides an extra layer of privacy. Not only in cryptocurrency has the successful adoption of BC been implemented but also in multifaceted non-monetary systems such as in: distributed storage systems, proof-of-location, healthcare, decentralized voting and so forth. Recent research articles and projects/applications were surveyed to assess the implementation of BC for enhanced security, to identify associated challenges and to propose solutions for BC enabled enhanced security systems.

- Ayush (2819907)
(B. Tech , 2nd year)

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Smart Lightning and Security System

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Abstract- As Electric Power is one of the major concerns, so the concept of the automatic lighting and security system saves the electrical energy. By using the automatic lightning, the consumption of electrical power can be minimized to a greater extent and for that sensors and microcontrollers can be designed in such a manner such that lights get ON/OFF based on motion in a room. The various sensors used for sensing the motion in an area are PIR motion sensor, IR Motion Sensor. An IR sensor senses the heat of an object and detects its motion within some range as it emits infrared radiations and this complete process can be controlled by microcontroller. Along with that security system can be applied in this concept by programming the microcontroller in such a way that if there is some movement in an area then lights must get ON/OFF automatically or any alarm must start. This chapter proposes the framework for the smart lightning with security systems in a building so that electrical power can be utilized efficiently and secures the building.

Keywords: IR sensors, IR radiations, microcontrollers.

NOMENCLATURE

IR: Infrared sensor
GSM: Global System for Mobile SONAR: SOund NAvigation and Ranging PIR: Passive Infrared Sensor

I. INTRODUCTION

As far as the industry is moving towards reducing man work with the help of automation. Hence, automation is playing a vital role in the growth of the economy and also helpful in normal day to day life. The main idea is to utilize the energy in an efficient way.

Automation System is a concept brought forward for smart cities buildings where the lightning system is automated i.e., when there is no movement in the room then the lights get switched off automatically and as soon as the human movement is involved the lights will get switch on by sensing the motion in a room. As there is loss of electrical energy in the homes when we leave the switches on while leaving the room. This emerging technology improves quality of living and provides them with automated secure system.

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When the electrical equipments in room are plugged in there is a flow of electricity and while it is not in use then it may cause accidents such as blaze from short circuit. Users forgot to switch off the electrical devices most of time when they leave the room. So to avoid these types of incidents , smart home technology can be considered as accurate solution. With the advancement in the technology, many smart home solutions have been considered and implemented to enable security and improving quality of living. A Smart home can be said as technology which is used to make all the electronic equipment around the home act smartly i.e. automated that is highly advanced automatic system for temperature balancing, security and many other functions.

II. HARDWARE SPECIFICATIONS

3.1 PRIMARY COMPONENTS

3.1.1 Aurdino Mega2560

A small computer on a single integrated circuit can be referred as Microcontroller. It consists of one or more processors with memory and programmable input- output peripherals embedded. The Aurdino Mega is a micro-controller board which is consists of analog and digital input-output pins that may be interfaced to other circuits and cables. It consists of has 54 digital input/output pins out of which 14 are used as PWM outputs, 4 UARTs (i.e. hardware serial ports) and 16 analog inputs, a USB connection a power jack, an ICSP header, a 16 MHz crystal oscillator and a reset button. It consists of whatever is required to support microcontroller. It simply just connects to the computer along with the USB cable with AC-to-DC adapter and battery to get started. The operating voltage is 5 V with input voltage of 7-12 V. The SRAM is 8 KB and EEPROM is 4 KB. The pins can be defined as :

Table 1

S.NO.	RX PIN NO.	TX PIN NO.
0	0	1
1	19	18
2	17	16
3	15	14

Table 2

EXTERNAL INTERRUPTS	PIN NO.
0	2
1	3
2	21
3	20
4	19
5	18

Table 3

SPI PINS	PIN NO.
MOSI	51
MISO	50
SCK	52
SS	53
SDA	20
SCL	21

Figure 1

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3.1.2 Sensors

For a smart lighting system Sensors are the major part and hence, power can be generated by combining the suitable sensors with the microcontroller. Infrared and Ultrasonic sensors are used for smart lightening. Infrared sensors are the electronic devices which sense the surrounding's characteristics which include the measuring of heat which is being emitted by any object in its range and also can detect the motion using infrared radiations. Ultrasonic sensors are devices which measures the distance to an object by using sound wave i.e. the sensors will detect the object by sending an echo. Distance between emitting short ultrasonic burst which will reflect back the sensor which will be controlled by micro controller can be measured by sensors. The ultrasonic sensors emits the short burst of 40 KHz which will travel through the medium of air and when it will hit the object it bounces back again to sensor.

3.2

3.2.1.1 Ultrasonic Sensors

It works on the principle of reflection of sound and for that it uses SONAR (SOund NAvigation and RAnging) technique which works on propagation of sound. The sensors are controlled by the microcontroller and on supplying the current by micro controller the sensors emits an echo which when strike by the object , the distance of object will be detected. That echo will reflect back to sensors and sensors will record all the readings through that. The Operating voltage for these sensors is 5 V with current of 15 mA. The effectual angle for the sensors is less than 15 and it can cover range 2 cm – 400 cm or 1" to 13 " feet. The total numbers of pins are 4 which are as follows:

Pin – echo for receiving input sensor (output) Pin – trig for sending ultrasonic signal (input) Pin – vcc power input

Pin – gnd ground

3.2.2 Relay Module

The Relay module in smart lightning system controls the high voltage electronic devices by turning the current on or off, letting to go through it or not. This is a switch which actually operates with the help of electromagnet. When the electromagnet starts with low voltage, say 5 volts from aurdino microcontroller, it pulls contact to make or either break a high voltage circuit. The trigger voltage is 5v DC with the current of 70mA. The maximum AC load is 10A (250/125v AC) and the DC load is 10A (30/28v DC). The maximum switching it can operate on is 300 operating/minute. The relay module has 5 pins which are described as:

1	COIL END 1
2	COIL END 2
3	COMMON (COM)
4	NORMALLY CLOSE(NC)
5	NORMALLY OPEN(NO)

Table 4

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Figure 2

3.2.3 Light Dependent Resistors

The Light Dependent Resistor also called LDR or photo resistor can be defined as device whose function is to resist incident electromagnetic radiation. This consists of semiconductor material with high resistance. The LDRs works on the theory

Figure 3

of photo conductivity in which the conductivity of material is increased whenever the light is being absorbed by material. When the light falls on the material the electrons in its valence band of semiconductor material got excited to conduction band. Through this process more current start passes through the device.

3.2.4 Connecting Wires

The Connecting wires used in home automation are of two types. These are Jumper wire or DuPont Wire. They are the electrical wires which is grouped in a cable, with a pin or connector at each end. The operating voltage is 5 - 12 V. These are considered as best in end to end connections with peripherals. There are three types of connecting wires which are as follows:

1. Male – Male
2. Male – Female
3. Female – Female

Figure 4

4. Proposed Framework

It works on principle of sound in the room i.e. sensors will sense the object by emitting the ultrasonic burst in the room and when the echo gets detected by the object, the sensor will measure the readings from that. Whenever there is little bit of heat is produced by the object or, can say that when human being enters into the room, it will have some temperature and when the echo sense that it will respond it back to sensors. Light Detecting Resistors act as insulator and it exhibits high resistance while in darkness it has low resistance and

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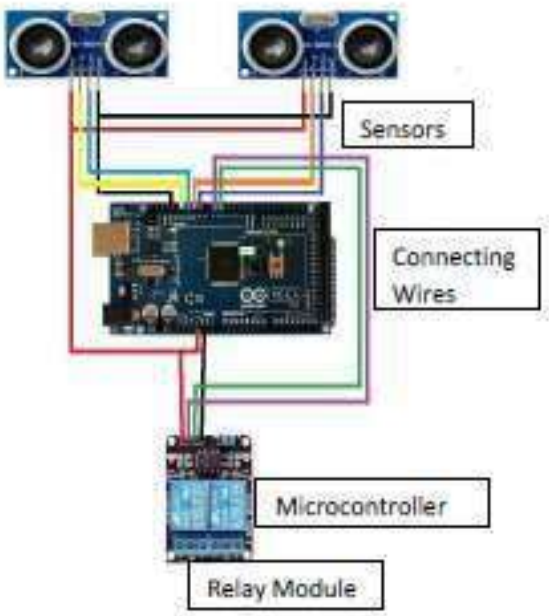
allows the current to pass through for flow of electricity.

The Light Detecting Resistors operate in the course of sensors and then these got activate underneath with lowest illumination condition and then controlled by the Amega micro-controller.

The circuit of Aurdino microporocessor has low power whereas the high performance micro controller is being programmed and this is done through embedded assembly programming laguage to implement the tasks. This program is operated and stored by storage devices which are EPROM.

1. Pin no. 1 of LDR is being attached to A0 port of Ardino mega- 2560 processor board.
2. All the IR sensors are attached to port no. 2, 3, 4, 5 and 6 (digital), which is the input signal to the micro processor board.
3. Connect it to the ground of sensors which are there to the GND port.
4. The LED's are connected to the output signals, to port no. 8, 9, 10, 11 and 12.
5. Then again the ground of all the sensors are connected to the GND port.
6. Power is then passed to the Arduino (7 - 12 V).

Figure 5



CONCLUSION

This chapter proposed a framework for smart lightening with security systems in a smart building. The main purpose to propose this framework is to save the electrical energy. By the use of automatic lightning, the electrical power consumption can be minimized and for that sensors and microcontrollers can be designed in such a manner such that lights get ON/OFF based on the motion in a room. Along with that security system can be applied in this concept by programming the microcontroller in such a way that if there is some movement in an area then lights must get ON/OFF automatically or any alarm must start.

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RIDDLE

FLOPPYDISK
HARDDRIVE
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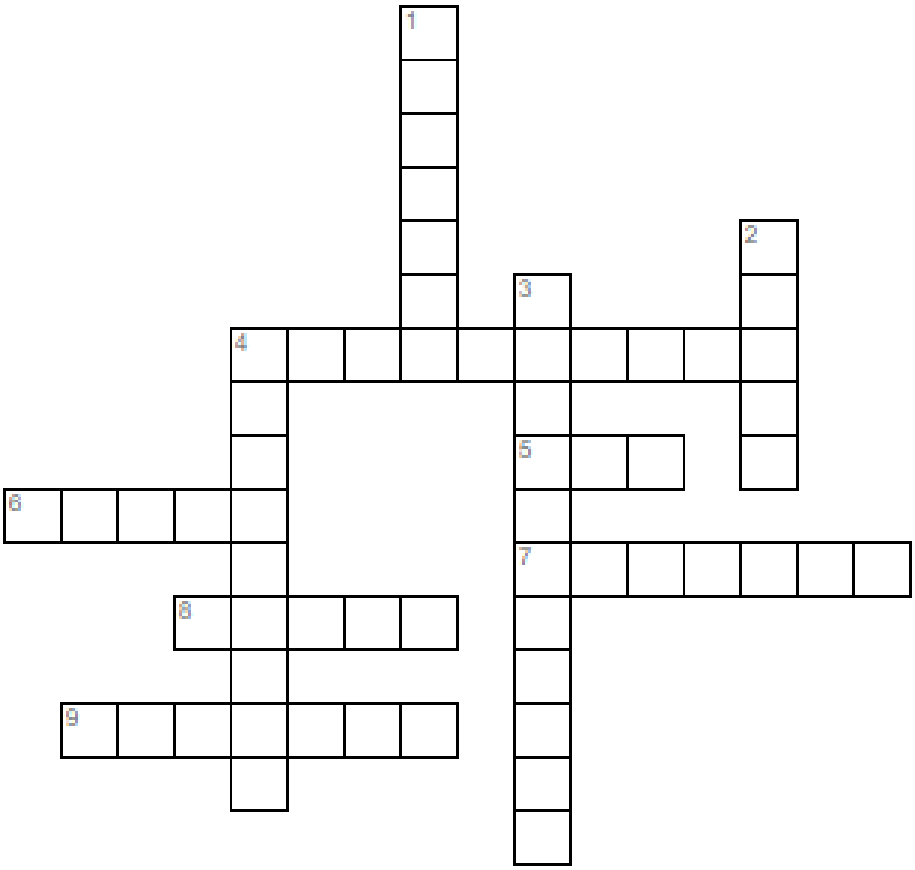
MICROPHONE
MODEM
MONITOR
MOUSE
PLOTTER
PRINTER
PROJECTOR
RAM
SCANNER
SCREEN
SPEAKER
SYSTEM
TRACKBALL

CROSS-WORD

Tech



Across

4 Private mast in your own home
5 Apple's OS
6 Check a customer's phone number details
7 Google's OS
8 Calling on 4G
9 Music streaming app

Down

1 Vodafone put device guides on here
2 Find a customer's site
3 Use your phone connected to the router when there's no mobile signal to make a call
4 Sports streaming app