电子信息工程系列教材

电信技术专业英语

江华圣 主编

WUHAN UNIVERSITY PRESS
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编 委 会

内容简介

本书旨在提高读者阅读理解和翻译专业英语的应用能力和以英语为工具获取交流信息的专业技术。

全书在体例上以单元来划分。每个单元都由课文、单词和词组、专业术语、注释、练习和阅读材料(阅读材料C为科普读物)组成。每四个单元之后有一套自我测试题。书中第二部分附有课文和部分阅读材料的参考译文,选材全部来自英文原版材料。本书知识覆盖面宽,并注意题材的多样性,通俗易懂,尽量使学生达到学用结合的目的。

本教材适合通信、电子信息类专业及相关的计算机科学、计算机应用专业以及相近专业的大学本科和高职高专的学生使用,也可供广大工程技术人员学习和参考。

前　言

随着科学技术的飞跃发展，电子信息技术（IT）又在受到迅速崛起的资讯技术（ST）的挑战。因特网及计算机网络技术的突飞猛进，又大大促进了电信与资讯行业的发展。一种以 PC 网络技术为基础、3e-技术为核心的发展趋势正在形成。为此，学习一定的英语基础知识，掌握专业英语的特点，对学习电子信息科学技术、通信与计算机的大学生尤其重要。本教程共有 16 个单元，课文全部选自美、英原文科普读物，课文包括了通信技术、信息技术、计算机网络及宽带知识、数字通信、光通信、卫星通信等专业知识，阅读材料取材丰富，包括网络通信、网络管理、无线电通信等最新技术。全书课文浅显易懂，语言生动活泼，适合于电子信息类相关专业的大学生学习。在大力倡导素质教育的今天，该教材正适合各大学分校、独立学院学生及各类工程技术人员学习电子信息技术专业英语的需要。

为帮助电子信息技术专业的技术人员学习和了解信息系统基础英语知识，本书选编了“An overview of what make up an information system: people, procedures, software, hardware and data”和部分考题供读者自我测试使用。书后附录编写了全书词汇、专业术语应用举例、常用缩略语和网络用语，可供读者查阅。

书后编有全部课文和部分阅读材料参考译文，以便使用本教材的教师备课和组织教学活动，又为学生提供较规范的语言样板，启发思路，便于模仿、实践和运用。

全书由武汉科技大学中南分校江华圣主编。

本书在编写过程中，得到了武汉科技大学中南分校王化文教授的指导与帮助，在此表示感谢。

本书在选材时，参考了国内外有关书籍和资料，编者向这些作者致以谢意。

由于通信技术发展日新月异，新的知识在不断扩展更新，加上编者的学识和水平有限，书中疏漏、错误之处在所难免，敬请广大读者不吝批评指正。

编　者

2007 年 3 月于武汉科技大学中南分校

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Part One

Unit One

Text

Digital Communications

Student: What is meant by digitizing a signal?

Engineer: It refers to sampling a signal at sufficient time intervals and coding these samples into one of N possible values.

Student: Clearly, a coded signal should be decoded in order to reproduce the original signal.

Engineer: That's right.

Student: Wouldn't the reproduced signal sound different from the original, unsampled one? It seems to me that sampling a signal chops it into pieces.

Engineer: Yes, it does. However, if a sufficient number of samples per second is taken, the decoded signal will reproduce an analog signal exactly like the original signal.

Student: I see. But would you please explain a little more about coding?

Engineer: Each sample can be assigned one of N possible values, dependent upon the magnitude of the sampled signal. For instance, let's say a sample can take on one of 64 different values. Each of these values is assigned a binary number.

Student: Yes, I know something about the binary system. The number 64 is 2^6 so that each sample is coded into six bits of information. Thus, one sample can have one of 64 binary coded values ranging from 000000 to 111111.

Engineer: That's absolutely correct.

Student: How many samples per second are taken?

Engineer: For regular voice communications, such as telephone transmissions, 6600 samples per second are considered sufficient for adequate fidelity.

Student: Then with 6600 samples per second and six bits per sample, the data is transmitted at a rate of 39,600 bits per second.

Engineer: Yes. Believe it or not, that's quite a low data transmission rate.

Student: Oh, I can believe it. I suppose the circuitry for processing these signals is quite simple by today's standards.

Engineer: That's right. All digital-to-analog and analog-to-digital converters for this kind of system use standard integrated circuits.

Student: Why is this kind of signal processing considered better than the old way of processing analog signals? I can see how integrated circuits have made digital signal processing possible, but I still don't fully understand the advantages of digitizing signals. Encoding and decoding signals seems to complicate rather than simplify signal processing.

Engineer: What you have said about complications has some truth to it. However, we gain more flexibility in processing encoded signals. Remember that each bit only takes on a value of zero or one.

Student: What does that fact have to do with flexibility?

Engineer: Well, we can shape pulses any way we wish. Thus, we can use square pulses, sinusoids of two different frequencies, or any other variety we choose.

Student: That's very interesting! What are some of the other advantages found in digitizing signals?

Engineer: When transmitted over long distances, noise distorts pulses. Repeater stations can receive a pulse, identify it as either a zero or one, and retransmit it as an undistorted pulse.

Student: That's very impressive I suppose that there are still other advantages to digitizing.

Engineer: Oh, yes. These are only example.

Words and Expressions

1. digitize	*v.*	使…数字化
2. sufficient	*a.*	足够的,充分的
3. interval	*n.*	间隔,时限
4. unsampled	*a.*	未取样品的
5. chop	*v.*	切细,斩,砍
6. decode	*v.*	译,译(码)
7. magnitude	*n.*	大小,数量值
8. range	*n.*	范围,区域
9. fidelity	*n.*	逼真(度),精确(度)
10. circuitry	*n.*	电路系统,网络
11. analog	*n.*	相似,模拟量
12. complicate	*v.*	(使)变复杂(使)变麻烦
13. flexibility	*n.*	灵活性,弹性
14. pulse	*n.*	脉冲
15. sinusoid	*a.*	正弦的
16. transmit	*v.*	传送,发射
17. distort	*v.*	使变形,失真
18. repeater	*n.*	增音机,中继器
19. identify	*v.*	辨认,识别
20. retransmit	*v.*	转播,重播

21. undistorted　　*a.*　无失真的
22. impressive　　*a.*　给人深刻印象的，感人的

Notes

1. It refers to sampling...and coding...
   译文：它指的是在足够的时间间隔内对信号进行采样并将这些信号编码为 N 个可取值中的其中之一。
   连词 and 连接两个并列句，后一句中省略了 It refers to（与前面一句中相同成分）。
2. But would you please explain a little more about coding?
   译文：你能给我多解释一下关于编码的知识吗？
   would you please 的用法同 would you like，语气委婉。
3. take on　接受，承担
4. Why is this kind of signal processing considered better than the old way of processing analog signals?
   译文：为什么认为这种信号处理方式比老的处理模拟信号方式要好一些呢？
   to be considered better than...　被认为要好一些…
5. I can see how integrated circuits have made digital signal processing possible.
   译文：我可以理解集成电路对数字信号进行处理的方式。
   句中的 see 作理解讲。
6. But I still don't fully understand...中的 fully 同 really，意思为完全、真的。
7. What you have said about complications have some truth to it.
   上句中的 what you have said about complications 为主语从句，在全句中作主语，意思是：你所说的有关错综复杂的问题…
8. We can shape pulses any way we wish.
   we wish 前省略了 that，整个 that we wish 作定语，修饰 way。

Exercises

1. Fill in the blanks with the proper terms from the list.

analog	fidelity	decoded
digital-to-analog	IC	analog-to-digital
encoded	repeater	digitized
bits		

(1) A _____ converter changes bits into analog signals.
(2) An _____ system processes a continuous signal.
(3) _____ measures how well the signal is reproduced.
(4) Sampled signals are _____ into binary pulses.
(5) A _____ reshapes and amplifies pulses.
(6) An _____ has many electronic components on a very small chip.
(7) The _____ signal gave a very accurate reproduction of the original picture.
(8) Many decoders use an _____ converter.

(9) The signal must be _____ before it is encoded.

(10) Each sample is coded into six _____ of information.

2. Read and translate the following passage.

Recently several thousand computers in the United States were attacked by a virus. The computers were slowed or shut down, but no information was lost, A computer virus is similar to a biological virus, and organism that 'can harm the human body. A computer virus is a series of electronic commands that can harm a computer or the information in the computer. It infects the device secretly. It tells the computer to do something the computer's owner does not want it to do. For example, a virus could enter a bank's computer system. It might tell the system to destroy all information about money belonging to everyone with the first name John. Like influenza virus that spread from person to person, a computer virus spreads from computer to computer. It was just such a virus that attacked computers across the United States last month, The virus was created by a university student studying computer science. ,The computers affected by the virus were in major universities, government agencies and private companies. They were part of United States Defense Department system. They were linked by telephones.

3. Translate the following sentences.

(1) Please explain to me the basic electronic circuits.

(2) A block diagram for this radio receiver is shown in Fig. 8 of your manual.

(3) Frequency modulation is a method of transmitting a message on radio.

(4) Rotate slowly the CURRENT control clockwise until the lamp comes on.

(5) We are having problems in station-to-station calling. All the other connections work well. First of all, would you examine it?

(6) This transistor circuit appears to be in good condition.

(7) Now I understand the outline of the problem. Anyway, may I see the receiver unit?

(8) The whole connection system is designed as a plug-in system therefore it can be installed in a very short time.

(9) What is the important feature of the model TR-101?

(10) Connect the ohmmeter across the end terminals.

Reading Material A

The Technology——MANs

From a technical standpoint, the evolution of LANs over the past few years does not lead to a clear picture of where the state of the art will be a few years from now.

However Besides Lans and Wans, no communications manager's vocabulary will be complete soon without a MAN (Metropolitan Area Network), a new technology of tremendous import world wide and in which Australia is in the box seat.

As john Farrell SAYS of QPSX , the new Australian-designed and developed MAN: It is the

first time an Australian company's technology has been selected for development as an international standard.

Farrell is director of commercial development and marketing with QPSX Communications Pty Ltd, formed last year by the University of Western Australia, Telecom, and a research group within the university's Department of Electrical and Electronic Engineering.

QPSX (Queued Packet and Synchronous Switch) was developed in the research group and is based on the principle that computers communicate in bursts and that such bursts are best handled in packets.

The uniqueness of QPSX lies in its recognition that "authorization" for a packet delivery does not have to be made before it is delivered, making transfer of these packets exceptionally swift.

Other advantages are reported to lie in the fact that multiple packets arrive in order and are guaranteed against transport, switch failure and tampering and the speed of transmission, selectable by the user, can go as high as the maximum equal to any foreseeable demand by the telecommunications industry.

These and other characteristics have resulted in the IEEE (Institute of Electronic and Electrical Engineers), a US-based standards organization, selecting QPSX for development as an international standard.

Illustrating how quickly technologies are moving, QPSX technology comes at a time when common carriers are getting behind Integrated Services Digital Network (ISDN) techniques.

However, QPSX technology with its high bandwidth capacity of 150Mbits/sec provides the basis for the integration of voice and data applications across a wider spectrum than is possible with the present stage of development of ISDN. The system is also comfortable with Video-conferencing.

Besides offering national carriers the ability to compete in the value-added network services area and to offer new application solutions for customers, Farrell said the advantages for users included:

Handling peak usage requirements on a demand basis, rather than dedicated resources.

Provision of a high degree of reliability without the need for backup facilities.

Catering for special "one off" needs.

Allowing for dynamic reallocation of capacity for out- of- hours transmission.

Providing very high levels of access security. The definition of a MAN includes the ability to employ a shared medium over areas of at least 50km in diameter.

If employed on a wide-scale basis, QPSX could have far-reaching social and economic effects. Large companies could more easily decentralize their operations within a large city.

Reading Material B

Digital Communications Technology

When the information the customer wishes to send is itself in digital form, i. e., a series of ones or zeros we are engaged in digital data communications (sometimes the adjective "digital" is