

# Study on New Technology of Electronic and Information Engineering

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**Abstract.** Electronic and information engineering is a subject of information control and processing with modern technology as the foundation. Electronic information industry is the leading industry of today's social development, development of the national defense capabilities and the national economy has multiplied and amplified, and is also the focus in international competition. Therefore, this paper from the current situation of the development of electric information engineering and the existence of the problem, the new technology to the electronic information engineering specialty such as virtual instrument technology, modern communication technology, electromagnetic field and microwave technology, computer technology, optoelectronic materials and devices are discussed, To enable students to master professional knowledge of electronic information and engineering, understand the status of the development of new technology, a good foundation for the further development.

## Introduction

Electronic and Information Engineering is a subject of information control and processing based on modern technology, which is mainly research is to obtain information, storage, transmission, detection, control, processing, and the development of electronic information equipment and design, application and integration technology of systems. Over the years, electronic information engineering has penetrated into various fields as an emerging industry, which has been promoting the development of the electronics industry and technology, but also to promote the differentiation and integration of industrial chain, breaking the boundaries between the industry, so that the industry between boundaries blur. While the new technology of electronic information engineering is the basis of technological innovation, it is to make electronic and information engineering development has entered a turning point to a higher stage of development [1]. Therefore, to explore new technology system of electronic information engineering has certain practical significance.

## Situation and Problems of Electrical Information Engineering Development

With the rapid development of electronic information industry, electronic information products and other industries combined, forming a chain of electronic information engineering, electronic information industry to not only promote the development of high-quality, but also stimulate domestic GDP growth, but it is also facing some problems when electronic Information Engineering rapid development, mainly reflected in the following aspects: [2]: ①From undergraduate education, the theory curriculum system of electronic Information Engineering and the rapid development of modern electronic technology is not synchronized, course content changed little and direction of traditional professional training program, most of the theoretical teaching, practice teaching hours arrangements less, such as "data acquisition technology" (36 hours of theory, experiment 8 hours), and the current development trend of the IT industry a serious gap, in the work of the students felt "knowledge of Learning irrelevant in practice, never learned in practice needed knowledge". ②And electronic information technology is relatively developed countries, the overall level of China's

electronic information technology is not high, although some industries the introduction of foreign advanced technology, but to a certain extent, restricted the independent innovation of China's electronic information industry development process [3]. ③ Electronic information industry development features are: Knowledge and technology integration, market and product combination, currently there are some industries over-reliance on foreign technology, lack of innovation, lack of independent brands and patents and other intellectual property rights.

**The new technology of electronic information engineering**

Electronic and Information Engineering relates to the content of electronic systems, communications systems, computer technology, it has a wide range of professional, industry span, more professional basic theory courses, practice the higher requirements, knowledge update faster and so on. Therefore, the curriculum system reform, should insist on broadening the professional knowledge ,to strengthen the principles of quality and ability training, to promote "capacity-based" curriculum model, for new technical contents of "streamlining, integration, restructuring, adding" so as to achieve electronic information technology teaching content overall optimization [4].

**The architecture of the new technology of Electronic Information Engineering.** From Figure 1, New technology content classification and integrate for electronic information engineering based on the training objectives,it will covers the electronic science, communication technology, computer science and information technology and so on, aims is services for creative talents of training electronic information.

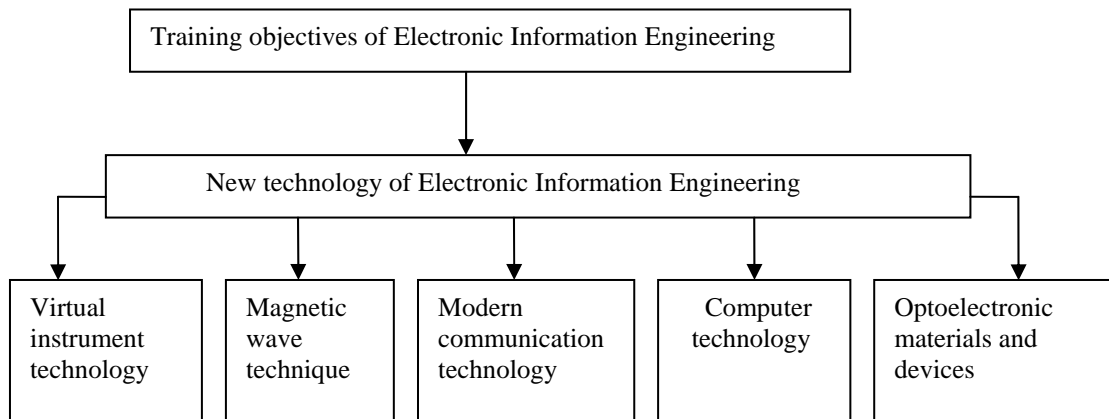


Fig. 1The architecture of the new technology of Electronic Information Engineering

**Virtual Instrument technology.** Virtual instruments are used to measuring instruments and comprehensive analysis for track the electrical quantity and non electrical quantity, which consists of a personal computer, the modular functional hardware and control software and application software, run through a rich graphical interface and programming language, complete measurement signal acquisition, analysis, judgment, display, store and so on. Computer screen as a virtual measurement instrument panel. It consists of knobs, switches, menus, data, wave and other components. Functional hardware module is composed of a signal generator cards, the oscilloscope card, frequency cards, card spectrum analyzer, logic analyzer card, IC card test, noise tester card, communications card and other components. Each features card corresponding to an instrument, Computer can easily call any of the instrument via the menu, Once selected an instrument, the computer screen will immediately show the virtual instrument panel, it can achieve automatic detection, automatic control, automated testing by operating a virtual panel, thereby greatly enhancing the use of measuring instruments, performance and functionality, it is a strong impetus to the development and promotion of science and technology .

**Modern communication technology.** Modern communications technology is the traditional communication technology With the combination of computer technology, control technology, digital signal processing technology, etc. It includes a digital communications technology,

program-controlled switching technology, information transmission technology (computer transmission), a communication network, data communications and data networks, broadband IP technology, access network and access technology. It is the general trend of development is the main fiber-optic communication, satellite communication and radio communication supplemented, It will technology development of broadband, integrated (and some said digitized), personal, intelligent communication network as the main content, goal is to achieve broadband, high-capacity, long-range, multi-user, high-security, high efficiency, high reliability, high flexibility of communications[5] .

**Electromagnetic field and microwave technology.**The main discussion is generating a radio frequency wireless signal, radiation, transmission, scattering theory, receiving and processing, technical and engineering applications about electromagnetic field and microwave technology. In the industrial, medical, defense and in everyday life, and their specific application performance for radio communication, radio, satellite communications, remote sensing and control, electronic warfare, radio astronomy, nondestructive detection, etc. especially microwave technology, because it has similar optical properties Features penetrating, wide band characteristic scattering properties, resistance to low-frequency interference characteristics, sight propagation characteristics, thermal effects features, informational, non-ionizing, distribution parameter uncertainty, it is widely used in microwave heating and microwave weapons, look at the advantages of microwave technology in various fields, we have reason to believe that it can be industrial production, environmental protection and other fields of conventional techniques in the near future.

**Computer technology.** Electronic Information Engineering is a subject of electronic information control and information processing by the application of computer technology, Current computer technology has invaded the curriculum content of the electronic information engineering, electronic information engineering relationships with increasingly close, which is mainly reflected in the following aspects: ①close integration of computer technology and microelectronics technology, the embedded computer systems has been rapid development, but also to make embedded system on chip SOC (System on Chip) to obtain a wide range of applications; ② processing of modern information technology needs the support of software technology, with the rapid development of software technology and the popularity of the Windows operating system applications, so that computer software technology lay the foundation for the development of electronic information technology, ③ rapid development of software technology, making the electronic information can be integrated into a computer program in the field of data operations, data conversion and data processing. ④ With the rapid development of computer simulation technology, making the design of electronic circuits and communications systems, analysis and simulation more convenient and efficient, there have been many software applications for different levels of EDA, covering the whole electronic design process. , ⑤ With the rapid development of computer technology, so that the computer technology, digital technology, microelectronics and information technology, communications technologies more closely. ⑥ Network and multimedia technology provide platform for the development of electronic information technology.

**Optoelectronic materials and devices.** Electronic and optoelectronic functional materials is one of the key foundation of electronic information industry, which is by its electrical, magnetic, acoustic, elastic, thermal, chemical, raw and other direct effect and coupling effect, which is mainly used to provide functionality for electronic devices and optoelectronic devices material, which is characterized mainly reflected in the following aspects: ① its particularly large number of categories ,varieties and specifications, and each have their own purpose, ② materials science is an interdisciplinary, it comes to chemistry, physics, electronics, mechanics, etc., with science, engineering crossover characteristics; ③ materials science is a development discipline of the less mature, the development of the material is still very much dependent on the accumulation of experimental and experience; ④ Development of functional materials with the device, system-related and sometimes difficult to split.

Optoelectronics is a cross-discipline of optical and electronics combining, it is called an optical frequency electronics or light electronics. Electronics amplification, oscillation, mixers, frequency, modulation, demodulation, switches, pulse, communications, computing, signal processing and the like can use the extension to optical frequencies, according to the function of initiative and passivity, which was classified as follows: ① active devices have single-frequency laser diodes, high-power visible laser diode laser, ultra-fast laser diodes, light emitting diode, a semiconductor laser amplifier, optical fiber laser device, in order to meet the development needs of the community, it is currently. the direction of the study are: single-frequency, high-power, high-speed, long wavelength, short wavelength, optoelectronic integrated circuits and other optoelectronic active devices. ② devices control of optoelectronic light modulator, light deflection optical switches and optical devices, etc. which can be light intensity, phase, frequency, polarization, direction and status active control, such devices plays an important role in optical communications, optical context switching, optical computing and optical information processing, and become an important research topic optics and optoelectronics. ③ Optoelectronics Passive devices have high-performance semiconductor photodiodes, infrared telemetry device and the solid imaging device. its has important application In communication, optical switching, optical computing, optical information processing, and other infrared remote sensing and guidance. And become a direct the main factor in the development of these areas affected[6].

## Summary

Electronic information industry is the leading industry in today's social development, its plays multiplication and amplification in development of national economy and improve of defense capabilities, it is also the focus of international competition today, The above analysis shows: new technologies of Electronic Information Engineering related to the virtual instrument technology, modern communications technology, electromagnetic field and microwave technology, computer technology, optoelectronic materials and devices, etc., Its broad scope and contents, electronic information engineering curriculum system construction, can not be fully reflected in the training program, Only interludes to introduce relevant courses as common sense, or to do lectures form to make a presentation, Only interludes to introduce relevant courses as common sense, or to do lectures form to make a presentation, so that students master the Electronic Information Engineering Course System at the same time, learn about new technologies of electronic information engineering development, with the aim has laid a good Foundation for the subsequent development.

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