Appendix O

AWARDING SAMPLE LIST

1. Awarding Circumstance

1.1 The First Prize of Shanghai Teaching Achievement Award

上海市教学成果奖

获奖证书

获奖成果：因材施教，重在教人“用本事”

获 奖 者：陈家壁　郑继红　董祥美
郭汉明　庄松林

完成单位：上海理工大学

获奖等级：一 等 奖

证书编号：20090085

上海市教育委员会　上海市人事局

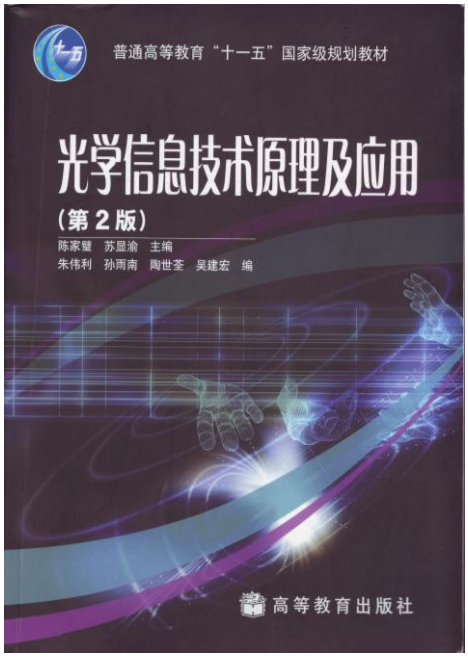
二〇〇九年十二月

1.2 Table 1. Excellent teaching material awarding list

Author Name	Awarding teaching material	Honor	Time
CHEN Jiabi	Principle and Application of Optical Information Technology	Excellent teaching material for the first prize in USST	2011
LI Xiangning	Engineering Optics	Excellent teaching material for the second prize in USST	2011
CHEN Jiabi	Laser Principles and Applications	Excellent teaching material for the third prize in Shanghai	2007

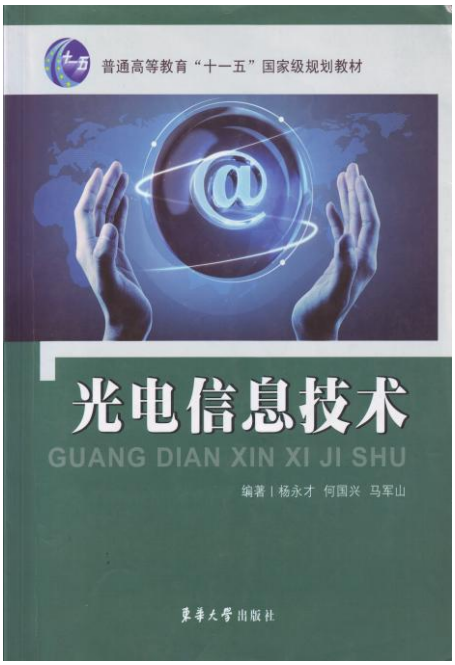
1.3 Table 2. Quality Courses List

Time	Level of Achievement	Course Name	Responsible professor
2008	national level	Optical Information Processing	ZHUANG Songlin
2009	municipal level	Laser Principles	CHEN Jiabi
2008	municipal level	Optical Information Processing	ZHUANG Songlin
2010	municipal level	Optoelectronics	YANG Yongcai
2012	municipal level	Engineering Optics	LI Xiangning



National top-quality Course “Optical Information Processing”

Top quality Course of Shanghai “Laser Principles”



Top quality Course of Shanghai “Optical electronics ”

Top quality Course of Shanghai “Engineering Optics’’


荣誉证书

上海理工大学

优秀教材奖

（2011年度）

教材名称：光学信息技术原理及应用

第一编著：陈家璧

出版社：高等教育出版社

获奖等级：一等奖

上海理工大学

二〇一一年十月

Chen Jiabi awarded the first prize of “excellent teaching material” for “principle and application of optical information technology” in 2011.

荣誉证书

上海理工大学

优秀教材奖

(2011年度)

教材名称：工程光学

第一编著：李湘宁

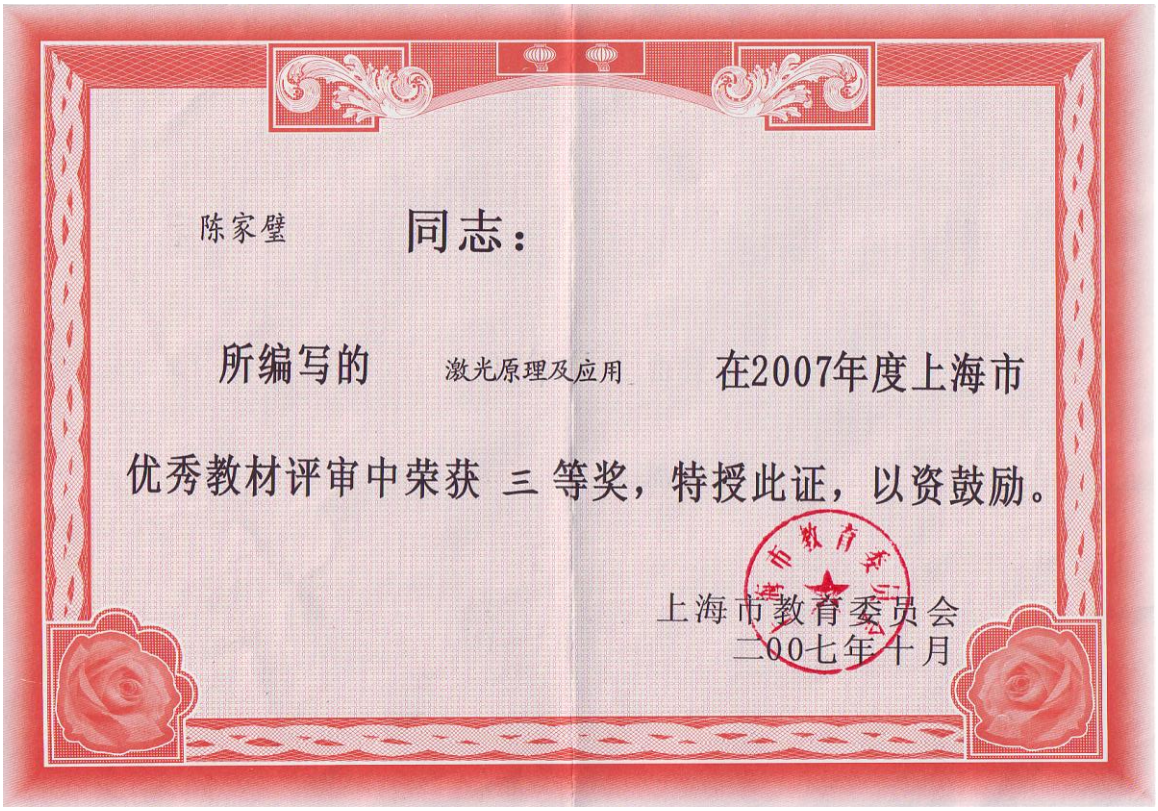
出版社：科学出版社

获奖等级：二等奖

上海理工大学

二〇一一年十月

Li Xiangning awarded the second prize of “excellent teaching material” for “engineering optics” in 2011.



陈家璧 同志：

所编写的 激光原理及应用 在2007年度上海市

优秀教材评审中荣获 三 等奖，特授此证，以资鼓励。

上海市教育委员会

二00七年十月

Chen Jiabi awarded the third prize in the review of excellent teaching material in Shanghai for “Laser Principles and Applications” in 2007.

1.4 Table 3. Students participating in various contest awarding sample list

Contestant Name	Honor	Time
Fu Zhenyu; Yin Penghong; Hu Nan	First Prize of "China Robot Competition and RoboCup open tournament wheeled Robot short holiday tour China"	2010
Feng Feng et al.	First Prize of "College Students Computer Proficiency Grand Prix in Shanghai"	2011
Wu Minjie; Zhou Chunqiao; Huang Lihua	First Prize of "College Students 'Challenge Cup' Competition in Shanghai"	2011
Bai Yunpeng	Second Prize of "National Undergraduate Electronic Design Contest"	2011
Wu Wenwei	Second Prize of "National Mathematical Contest in Modeling"	2011
Ding Honghui	Second Prize of "Design and Development of National Software professionals Competition"	2011
Yuan Wei	Second Prize of "China Service Robot Contest"	2011
Bao Qi	Second Prize of "31st World Mind Olympic Final"	2010
Yao Chen	Second Prize of " 'Tianhua Cup' National electronic professionals design and skills competition"	2010


荣誉证书

HONORARY CREDENTIAL

刘孝冬、郑宝山、王琦

荣获 2011 年全国大学生电子设计竞赛上海赛区（TI 杯）本科生组

三等奖

上海市教育委员会

全国大学生电子设计竞赛上海赛区组织委员会

二〇一一年十月

Liu Xiaodong, Zheng Baoshan and Wang Qi awarded third prize of "National Undergraduate Electronic Design Contest" in 2011.

全国软件专业人才设计与开发大赛

获 奖 证 书

上海理工大学丁洪辉

荣获2011年“国信蓝点杯”全国软件专业人才设计与开发大赛

上海赛区JAVA软件开发本科组 一等奖。

特发此证，以资鼓励。

二〇一一年六月七日

Ding Honghui awarded first prize of “ ‘Guoxinlandian Cup’ Design and Development of National Software professionals Competition” in 2011.

获奖证书

上海理工大学上理沪江二队在“2010 中国机器人大赛暨 RoboCup 公开赛”（7月 18—20 日，鄂尔多斯）中荣获轮式机器人短假游中国比赛

一 等 奖

特发此证。

参赛队伍

指导老师：杨晶东、蒋念平

领队：杨晶东

队员：付振宇、尹鹏鸿、胡楠

中国自动化学会机器人竞赛工作委员会

RoboCup 中国委员会

科技部高技术研究发展中心

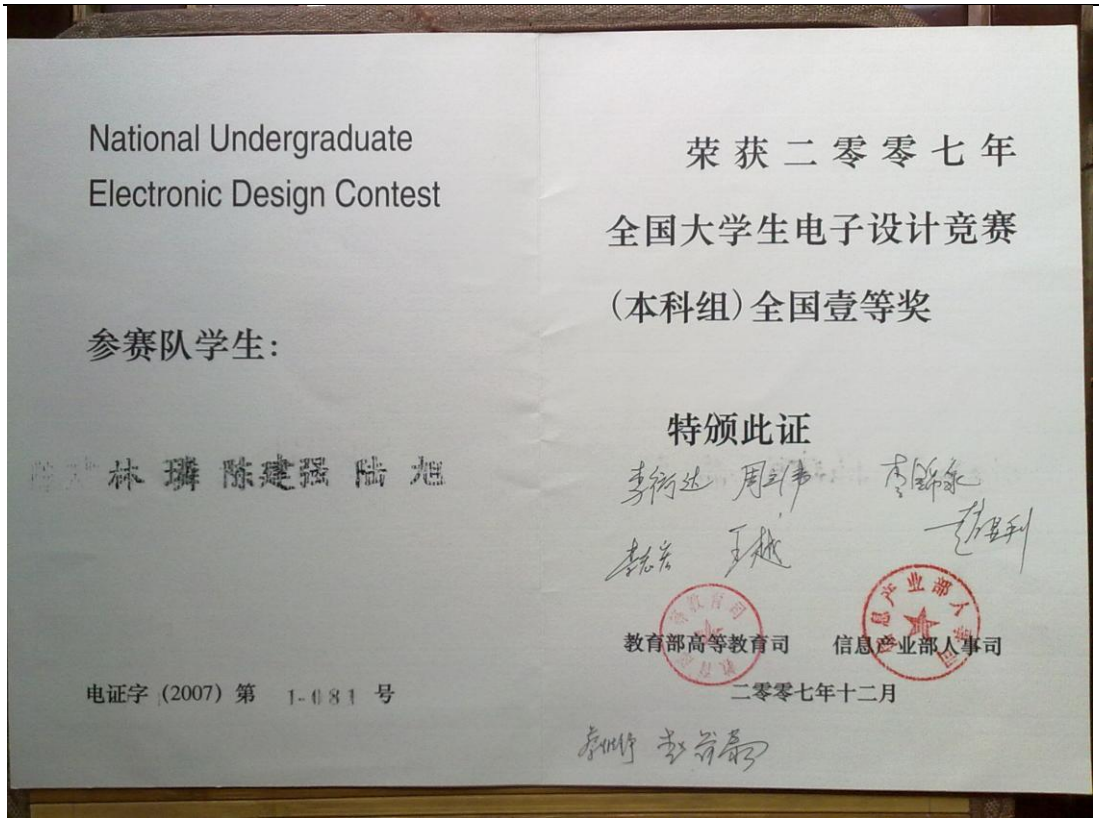
内蒙古鄂尔多斯市人民政府

2010 年 7 月 20 日

Fu Zhenyu, Yin Penghong and Hu Nan awarded first prize of “China Robot Competition and RoboCup open tournament wheeled Robot short holiday tour China” in 2010.

Xu Jiaming awarded third prize of “National College Students Mathematical Contest” in 2009.

Wang Hongqin, Sheng Jili and Zhang Jing awarded third prize of “National Mathematical Contest in Modeling” in 2008.



Lin Lin,Chen Jianqiang and Lu Xu awarded first prize of "National Undergraduate Electronic Design Contest" in 2007.

2. Paper published

[1] Qiuping Deng, "Reliable Information Embedding For Image/Video in the Presence of Lossy Compression" , Singal Processing: Image Communication ,2012, Jan.22:66-74,EI,SCI.

[2] Yufei Zhang , Zhe Fu, "Word text watermarking for IP protection and tamper localization" , Int Conf Artifical Intelligence, Management Science and Electronic Commerce ,2011, Aug.8-10, EI.

[3] Huwen Guo, Hanming Guo, Songlin Zhuang, "Analysis of imaging properties of a microlens based on the method for a dyadic Green's function," Appl. Opt., 48(2):321-327 (2009) (SCI: 402DK)

[4] Hanming Guo, Songlin Zhuang, Shuwen Guo, Jiabi Chen, and Zhongcheng Liang, "Multilayered optical memory with bits stored as refractive index change. II. Numerical results of a waveguide multilayered optical memory," J. Opt. Soc. Am. A 25(7): 1799-1809 (2008). (SCI: 330GF)

[5] Hanming Guo, Shuwen Guo, Jiabi Chen, and Songlin Zhuang, "Full and rigorous vector diffraction model for a multilayered optical disc," Opt. Express. 16(4): 2797-2803 (2008). (SCI: 268BE).

[6] Runling Peng, Jiabi Chen, Cheng Zhu, Songlin Zhuang, "Design of a zoom lens without motorized optical elements", Optics Express, 2007, 15(11): 6664-6669. (SCI: 178SL)

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journal homepage: www.elsevier.com/locate/image

Reliable information embedding for image/video in the presence of lossy compression

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ABSTRACT

Lossy compression is inherently contradictory with information hiding and may result in unreliable retrieval of embedded message. For most of the existing data hiding algorithms, the process of dealing with the conflict and trade-off of invisibility, capacity and robustness is done in an experimental fashion. We have developed an image and video unified data-embedding technique. The algorithm is capable of accurately retrieving hidden data after the embedded signals are subjected to JPEG/MPEG compression as long as its compression degree is above the predefined one. Embedding strategy is to integrate data hiding into the JPEG/MPEG coding structures and to combine the adjustment factor of the strength and quantity of data hiding with the control parameter of lossy compression, according to the constraint of human visual system, the demand of hiding capacity and distortion impact of lossy compression. Experimental evaluation demonstrates that the proposed algorithm allows us to hide data invisibly in an accurate retrievable way with effective and flexible trade-off mechanism in the presence of lossy compression. In addition, the scheme is robust to some common attacks including low-pass filtering, noisy interference, frame dropping and transcoding.

1. Introduction

For many information hiding applications, there is a strong need that a marked signal is compressed for more efficient storage or transmission. The compression of the marked content may be required to accommodate diverse and dynamic capabilities and conditions of terminals and networks. However, the objective of lossy compression is fundamentally in conflict with information hiding. Perceptual compression algorithm eliminates irrelevant and redundant information that is very likely related to the embedded message. It causes two major problems. The first problem is that lossy compression has a significant impact on the retrieval of information hidden in digital media. The second problem appears in combination with compression processing after embedding, which might result in the failure of achieving the desirable compression level while keeping the embedded information imperceptible. In order to make data hiding based application feasible, one of the fundamental issues is to find a proper trade-off among crucial data hiding requirements: imperceptibility, capacity and robustness to lossy compression. The widespread use of DCT-based compression standards makes JPEG/MPEG-resisting and -compatible data hiding an important aspect for algorithm design [1–4].

A great deal of research has proposed a variety of embedding strategies to trade-off conflicting information hiding requirements. Cox et al. [5] introduced two very important concepts for robustness and transparency of data hiding. Firstly, the secret message should be embedded into the most perceptually significant components of a host signal to achieve robustness. Secondly, the concept of spread spectrum communications was applied to minimize the embedding modifications of the significant perceptual

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Qiuping Deng, “Reliable Information Embedding For Image/Video in the Presence of Lossy Compression’’

Word Text Watermarking for IP Protection and Tamper Localization

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School of Optical-Electrical & Computer Engineering
University of Shanghai for Science and Technology
Shanghai, China

***Abstract*—Intellectual property rights protection and authentication of digital content are the increasing major concerns in the current digital era. In this paper, we propose a digital watermarking technique for embedding data in WORD formatted texts by character-shift coding. Several strategies are applied in the system to improve invisibility, security, robustness and tamper localization, such as redundancy embedding, encryption, error correction coding, random position embedding, and human visual systems. Simulation results show that the proposed watermarking system is resilient in face of various format manipulations (such as font type, font size, fond color, underline, and line space) as well as content tampers (such as replacement, insertion and deletion of words and paragraphs). Due to the robustness, tamper localization and high embedding capacity, the scheme can serve the purposes of copyright protection, authentication and tamper detection, and covert communications.**

Keywords-digital rights management, security, digital watermarking, multimedia content protection, word text

I. INTRODUCTION

Recently Dynamic proliferation of multimedia processing and transmission in digital form has brought the requirements of multimedia security and multimedia content protection. Electronic documents are more easily copied, altered and redistributed by unauthorized persons than paper documents, impacting the digital media industry and damaging economic, social and culture. Intellectual property rights protection and authentication of digital content have become the major concerns in the current digital era. The DRM system provides security technology for digital content dissemination, management, protection and ownership rights. Watermarking is used as part of a system for Digital Rights Management. By employing the watermarking, which embeds the secret messages on meaningful files and deliveries between transmitters and receivers, illegal copy, tamper, and redistribution can be discouraged [1].

Researchers have put forward a number of digital watermarking solutions. Depending on the types of the host media, watermarking techniques can be divided into four categories: image watermarking, video watermarking, audio watermarking and text watermarking. Over the last few years, watermarking has been largely addressed toward image, audio, and video, and attracted a number of research groups working in these domains. Generally speaking, the watermarking techniques for image, audio and video are similar in principles and thoughts but they can not be used for text documents directly. Design issues of text watermarking are greatly different from those of other multimedia watermarking. Nowadays, as computer technologies and internet developed, many enterprises, organizations, governments and public institutions provide and publish more and more important data and valuable information existing in text documents, such as word, excel, HTML and PDF etc. Therefore, text watermarking is an important area of research. New techniques and ideas for text watermarking are in urgent need. However, the previous work on digital text watermarking is relatively very scarce and develops slowly [2].

According to different embedding modes, text watermarking can be categorized into three main groups: binary image methods [3], natural language processing methods [4], and format-based methods [5]. Binary images have only two distinct pixel color values, so the capability of data hiding is very limited because of the lack of redundancy on the image carrier. Natural language processing methods denote hiding information in the content of text documents, which means that hiding information by linguistic transformations, such as synonym substitution, semantic and syntactic transformations. Natural language processing methods improve the capability of robustness to attacks of watermarking system. Because watermarking algorithms based on semantics are hard to embed watermark without changing the original meaning of the carriers, they are not applicable to text documents which contents can not be modified. Format-based watermarking embeds information into a formatted document by altering either the appearance or the position of a text element such as an individual character or word [6-9].

The format-based approaches can be classified as line-shift coding, word-shift coding, and feature-shift coding according to embedding methods. The most classic algorithm was proposed by Brassil et al [5]. They described and compared three different ways to insert invisible watermark in text documents to protect copyright. The three kinds of text watermarking are based on the fine-tuning of the document spatial structure to embed the watermark, including line space coding, word space coding, and feature coding. In line space coding, the entire lines, which are required to embed information, are shifted up and down slightly according to the watermark data bit flow. The second watermarking method proposed by Brassil et al. is called word space coding, which embeds watermark by horizontally shifting some special words in a line. As the word spaces of a document are not fixed, so to determine whether it contains watermark needs the original document. The feature coding method inserts a watermark by

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Yufei Zhang ,Zhe Fu, “Word text watermarking for IP protection and tamper localization’’

Analysis of imaging properties of a microlens based on the method for a dyadic Green's function

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The dyadic Green's function (DGF) is applied to examine the effect of focal shift in a spherical microlens with the variation of the numerical aperture for a given Fresnel number when a monochromatic plane wave with x linear polarization is incident on the microlens. By comparing the results based on the method for the vector Kirchhoff diffraction theory [J. Opt. Soc. Am. A **22**, 68–76 (2005)], the effect of the spherical aberration on focal shift in a microlens is evaluated, and the influences of NA as well as the spherical aberration on the transverse electric energy density distribution in the focal plane are also investigated. In contrast with other vector formulations of imaging theory, which mainly focus on the focal shift in an aplanatic system, the DGF method is more practical and effective to locate the principal maximum energy density along the normal axis and to study transverse electric energy density distribution, because the actual shape of a microlens and the effects of aberrations are considered. © 2009 Optical Society of America

OCIS codes: 220.3630, 230.3990, 260.1960.

1. Introduction

A microlens with a large NA is a critical element for micro-optical applications such as optical communication [1], optical storage system [2], and display system [3]. Thus the fabrication and characteristic study of the microlens have been subjects of considerable research interest [4,5], and the focal length of the microlens is an essential parameter to be used in the application of it. We know from [6–10] that in a system with a small Fresnel number ($N = a^2/(\lambda f)$) and large NA ($\mathrm{NA} = a/f$, a is the aperture radius, λ is the wavelength, and f is the focal length), the position of the principal maximum energy density along the optical axis does not locate at the geometric focus as assumed in geometric optics, but shifts toward the diffractive screen. This phenomenon, referred to as focal shift since its importance in the location of principal maximum energy density and in image quality and ultimate resolution of the system, has been investigated in light of both the scalar and the vector diffraction theories [6–10].

In the scalar diffraction theories [6,7], Li assumed that a monochromatic, convergent, spherical wave centering at the geometric focal point was diffracted at a circular aperture in an opaque screen. Then the scalar Kirchhoff diffraction theory (KDT) was applied to examine the effect of focal shift on system parameters and to obtain the upper limit of NA for a given N [7]. Based on ray-tracing procedures and energy conversation law [8,9], Li derived an expression of focal spherical wavefront in the image space, then used vector KDT [8] and vector Rayleigh diffraction integrals [9] to study the effect of focal shifts. Kirchhoff boundary conditions were accepted in both theories [8,9]. Recently, Wang *et al.* [10] selected the incident converging light in the aperture as the vector form of the radiated field of an electric dipole in the far-field region. By using the Borgnis potentials, the dependence of the focal shift on the geometric parameters without Kirchhoff assumption was discussed [10].

0003-6935/09/020321-07$15.00/0

Multilayered optical memory with bits stored as refractive index change. II. Numerical results of a waveguide multilayered optical memory

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[2]*College of Optoelectronic Engineering, Nanjing University of Posts and Telecommunications, 66 Xin Mofan Road, 210003 Nanjing, China*
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In terms of the electromagnetic theory described in Part I of our current investigations [J. Opt. Soc. Am. A **24**, 1776 (2007)], the numerical method for and results of numerical computations corresponding to the electromagnetic theory of a waveguide multilayered optical memory are presented. Here the characteristics of the cross talk and the modulation contrast, the power of readout signals, the variation of the power of the readout signals with the scanning position along the track, and the distribution of the light intensity at the detector are investigated in detail. Results show that the polarization of the reading light, the feature sizes of bits, and the distances between the two adjacent tracks and the two adjacent bits on the same track have significant effects on the distribution of the light intensity at the detector, the power of the readout signals, the cross talk, and the modulation contrast. In addition, the optimal polarization of the reading light is also suggested. © 2008 Optical Society of America

OCIS codes: 210.4680, 260.2110.

1. INTRODUCTION

A novel waveguide multilayered optical memory (WMOM) [1] was first reported in 2002, and the primary experiment [2] presented in 2004 demonstrated the feasibility of a WMOM. Recently, Yang *et al.* proposed a simple model describing the side scattering in the WMOM and deduced an expression for the relation between the attenuation coefficient and the light propagation distance of a waveguide with a distributed attenuation coefficient [3]. In the first part of the current study [4], which is hereafter called Part I, we developed an electromagnetic theory of a WMOM for the static case with the Lippman–Schwinger equation, dyadic Green's functions, and the vector coherent transfer function. This theory [4] is rigorous in itself and able to be used for the optimum design of a WMOM, but its effective applications require highly powerful numerical methods, which mainly include numerical calculations of the Lippman–Schwinger equation and the electric dyadic Green's function (EDGF).

In this paper, we shall focus our attention on the investigation of the improvement of the performance of a WMOM. In order to accomplish this aim, first, we outline the general numerical method for the electromagnetic theory of a WMOM [4], and, second, we introduce briefly a sort of numerical method for the EDGF associated with the planar multilayered media that is a major concern in the applications of the theory of a WMOM [4] and an important problem in the electromagnetic field computation region [5–10]. Finally, we investigate in detail the relationships between the modulation contrast and the feature sizes of bits and the modulation contrast and the thickness of the core, the relationships between the cross talk and the feature sizes of bits and the cross talk and the distance between the two adjacent tracks or the two adjacent bits on the same track, the relationship between the power of the readout signals and the length of bits, the variation of the power of the readout signals with the scanning position along the track, and the distribution of the light intensity at the detector. In the following analyses, the definitions of some variables or concepts have not been given for simplification. Interested readers are referred to Part I [4].

2. INTRODUCTION TO THE NUMERICAL METHOD

A. Numerical Method for the Electromagnetic Theory of a WMOM

The schematic diagram of a WMOM is composed of the reading system, the waveguide multilayered disc (WMD) (i.e., storage medium), and the detection system consisting of a confocal microscope (Fig. 1). The structure of the WMD is shown in Fig. 2, where the refractive indices of the cladding and substrate are identical. In terms of the operation principle [4] of a WMOM, a complete electromagnetic theory of a WMOM should find the electric field

1084-7529/08/071799-11/$15.00

Design of a zoom lens without motorized optical elements

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**Corresponding author: pengrunling@gmail.com*

Abstract: A novel design of a zoom lens system without motorized movements is proposed. The lens system consists of a fixed lens and two double-liquid variable-focus lenses. The liquid lenses, made out of two immiscible liquids, are based on the principle of electrowetting: an effect controlling the wetting properties of a liquid on a solid by modifying the applied voltage at the solid-liquid interface. The structure and principle of the lens system are introduced in this paper. Detailed calculations and simulation examples are presented to show that this zoom lens system appears viable as the next-generation zoom lens.

OCIS codes: (220.2560) Focus, (220.2740) Geometrical optics, optical design

References and links

1. L. Saurei, G. Mathieu, and B. Berge, "Design of an autofocus lens for VGA ¼-in. CCD and CMOS sensors," Proc. SPIE **5249**, 288-296 (2004).
2. G. I. Swanson and W. B. Veldkamp, "Infrared applications of diffractive optical elements," Proc. SPIE **883**, 155-158 (1988).
3. M. Ignacio, L. Claudio, M. Andres, C. Juan, and J. Y. Maria, "Modulation light efficiency of diffractive lenses displayed in a restricted phase-mostly modulation display," Appl. Opt. **43**, 6728-6284 (2004).
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6. B. Berge and J. Peseux, "Variable focal lens controlled by an external voltage," Eur. Phys. J. E. **3**, 159-163 (2000).
7. S. Kuiper and B. H. W. Hendriks, "Variable-focus liquid lens for miniature cameras," Appl. Phys. Lett. **85**, 1128-1130 (2004).

1. Introduction

Zoom lenses in imaging systems such as cameras must satisfy two basic requirements: adjustable focal length and fixed image plane. Traditional zoom lens systems usually comprise several fixed lenses, which satisfy the requirements by motorized movements [1]. As a result, delicate driving motors must be used to provide desired control over the mechanical positions of lenses and precise space cams must be utilized to implement synchronized movements. Such conventional solutions have been considered to be complicated, fragile and thus expensive. In addition they are also not convenient to be implemented in small spaces, such as in mobile phone cameras.

An alternate solution, a kind of refraction-diffraction combined variable-focus lens has been presented [2, 3]. It makes use of LCD Fresnel lenses. Electrically motivated, the LCD Fresnel lenses can vary the focal length by changing the refractive index of LCD without involving any motorized movements. However, disadvantages such as large chromatic aberrations, multi-focuses and difficulty in keeping the imaging plane fixed etc. pose an obstacle to this solution.

Researchers at Philips recently reported a double-liquid variable-focus lens based on electrowetting [4]. Unlike conventional solutions, a double-liquid lens changes its focal length electrically, not mechanically. On the other hand, the disadvantages of the LCD Fresnel lenses

#82614 - $15.00 USD Received 30 Apr 2007; revised 2 May 2007; accepted 3 May 2007; published 15 May 2007

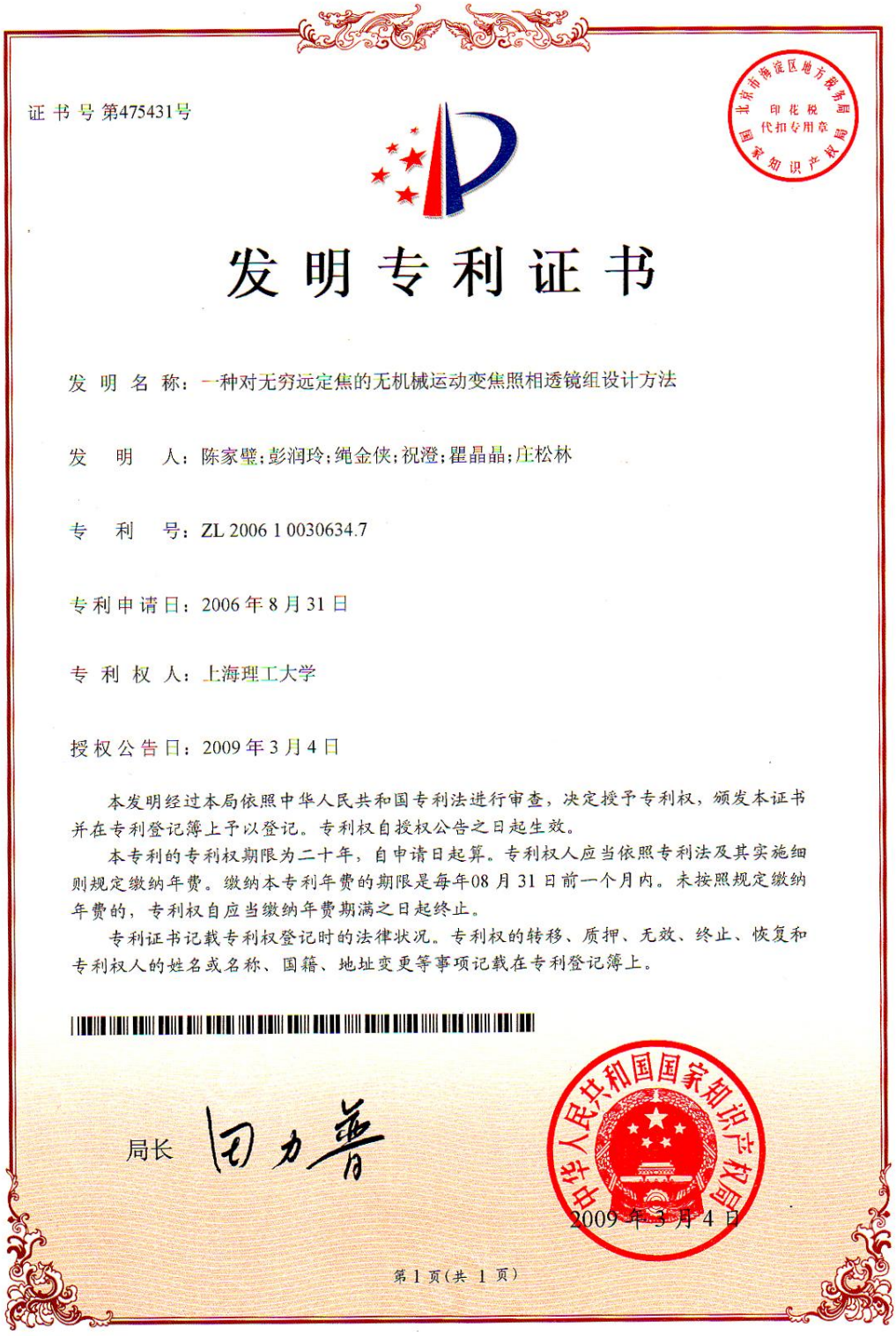
3.Patent obtained

[1] Jiabi Chen, Runling Peng, Jinxia Xing, Cheng Zhu, Jingjing Zhai, Songlin Zhuang, “A design method of photographic lens group without mechanical movement for an infinity fixed focus” , National invention patent, 2009, Patent NO.: ZL200610030634.7.

[2] Junshan Ma, Wenhua Gu, “The enzyme labeled microplate automatically detector”, National invention patent, 2009, Patent NO.: ZL200720075797.7.

[3] Lili Liu, Shitong Wang, Rui Chen, Mian Wang, Dongxue Zhao, Yongcai Yang, Junshan Ma, “Plasma cutting machine control device” , National invention patent, 2009, Patent NO.: ZL200820058104.8.

[1]Jiabi Chen, Runling Peng, Jinxia Xing, Cheng Zhu, Jingjing Zhai, Songlin Zhuang, “A design method of photographic lens group without mechanical movement for an infinity fixed focus”, National invention patent, 2009, Patent NO.: ZL200610030634.7.



证书号第475431号

北京市海淀区地方税务局 印花税 代扣专用章 国家知识产权局

发明专利证书

发明名称：一种对无穷远定焦的无机械运动变焦照相透镜组设计方法

发明人：陈家璧；彭润玲；绳金侠；祝澄；瞿晶晶；庄松林

专利号：ZL 2006 1 0030634.7

专利申请日：2006年8月31日

专利权人：上海理工大学

授权公告日：2009年3月4日

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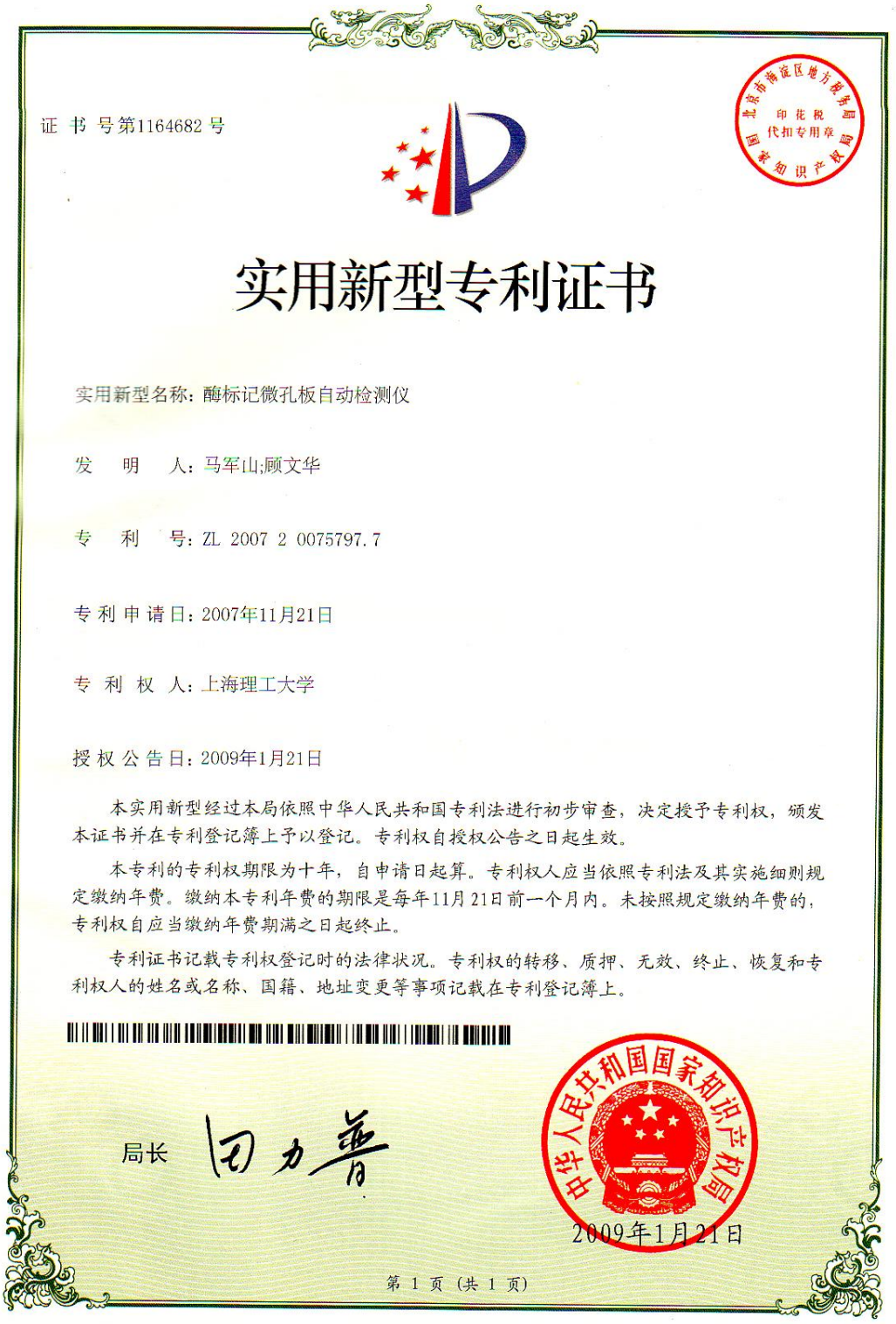
2009年3月4日

第1页(共1页)

[2]Junshan Ma, Wenhua Gu, “The enzyme labeled microplate automatically detector”, National invention patent, 2009, Patent NO.: ZL200720075797.7.



证书号第1164682号

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实用新型专利证书

实用新型名称：酶标记微孔板自动检测仪

发明人：马军山;顾文华

专利号：ZL 2007 2 0075797.7

专利申请日：2007年11月21日

专利权人：上海理工大学

授权公告日：2009年1月21日

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2009年1月21日

第 1 页（共 1 页）

[3]Lili Liu, Shitong Wang, Rui Chen, Mian Wang, Dongxue Zhao, Yongcai Yang, Junshan Ma, “Plasma cutting machine control device”, National invention patent, 2009, Patent NO.: ZL200820058104.8.

证 书 号第1185417 号

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实用新型专利证书

实用新型名称：等离子切割机控制装置

发 明 人：刘立立;王世通;陈蕤;王勉;赵东雪;杨永才;马军山

专 利 号：ZL 2008 2 0058104.8

专利申请日：2008年5月7日

专 利 权 人：上海理工大学

授权公告日：2009年3月4日

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2009年3月4日

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