永是

浙江大學信息學部
FACULTY OF INFORMATION TECHNOLOGY,
ZHEJIANG UNIVERSITY

信息学部
浙江大学
永是
Annual Report 2010
FACULTY OF INFORMATION TECHNOLOGY
ZHEJIANG UNIVERSITY

地址：浙江杭州浙大路 38 号
邮编：310027
电话：0571-87952316
传真：0571-87951077
网址：http://fit.zju.edu.cn
邮箱：fit@zju.edu.cn

Address：No.38 Zheda Road,Hangzhou Zhejiang
Zip：310027
Tel：0571-87952316
Fax：0571-87951077
Wed site：http://fit.zju.edu.cn
E-mail：fit@zju.edu.cn

CFIT

浙江大學信息學部
Faculty of Information Technology
Zhejiang University
永是

Annual
Report 2010
年报

Annual Report 2010
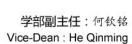Faculty of Information Technology
Zhejiang University

信息学部涵盖了光电信息工程学系、控制科学与工程学系、信息与电子工程学系、计算机科学与技术学院、软件学院、生物医学工程与仪器科学学院。学部共有7个一级学科，其中光学工程、控制理论与工程、生物医学工程为国家重点学科，另有计算机应用和通信与信息系统两个二级学科为国家重点学科；拥有3个国家重点实验室，1个国家专业实验室，2个国家工程研究中心，建有21个研究所，主要开展信息领域科学和工程技术问题的创新研究。

Introduction to FIT

Faculty of Information Technology (FIT) of Zhejiang University(ZJU) comprises of three departments and three colleges, namely Department of Optical Engineering, Department of Information Science and Electronic Engineering, Department of Control Science and Engineering, College of Computer Science and Technology, College of Biomedical Engineering & Instrument Science and College of Software Technology. Currently, FIT has 7 primary disciplines, in which there are 3 national key disciplines: Optical Engineering, Control Science and Technology, and Biomedical Engineering. Besides, 2 secondary disciplines, Computer Application Technology, Communication and Information System, are also national key disciplines. Under its administration, there are 3 State Key Laboratories, 1 National-specialized Laboratory, 2 National Engineering Research Centers, 21 research institutes, to devote in the basic research and the innovation of technical problem in the area of information technology.

学部主任：刘 旭
Dean：Liu xu

学部副主任：何钦铭
Vice-Dean：He Qinming

AnnualReport 2010

Faculty of Information Technology
Zhejiang University

目录

信息学部
浙江大学

Faculty of Information Technology
Zhejiang University

CFIT 浙江大学
信息学部

01

Organization
学部机构

▍学术委员会
主 任：孙优贤　副主任：刘 旭
委 员：何赛灵　童利民　刘 承　严晓浪　章献民
　　　　张宏非　张宏建　荣 冈　庄越挺　陈 纯
　　　　孙守迁　吴朝晖　周 昆　郑筱祥　汪乐宇

▍Academic Committee
Director: Sun Youxian　Vice- Director: Liu Xu
Committee members:
He Sailing　　　Tong Limin　　Liu Cheng
Yan Xiaolang　　Zhang Xianmin　Zhang Zhongfei
Zhang Hongjian　Rong Gang　　 Zhuang Yueting
Chen Chun　　　Sun Shouqian　 Wu Zhaohui
Zhou Kun　　　 Zheng Xiaoxiang　Wang Leyu

▍学位委员会
主 任：鲍虎军　副主任：何钦铭
委 员：白 剑　苏宏业　陈德人　宁钢民
　　　　金仲和　欧阳宏伟　徐 文　傅 新
　　　　鲍世宁

▍Academic Degrees Committee
Director: Bao Hujun　Vice- Director: He Qinming
Committee members:
Bai Jian　　　Su Hongye　　 Chen Deren
Jin Zhonghe　Xu Wen　　　 Ouyang Hongwei
Fu Xin　　　 Bao Shining

▍人力资源委员会
主 任：刘 旭　副主任：段会龙
委 员：顾培夫　童利民　刘向东　严晓浪　章献民
　　　　张朝阳　孙优贤　张宏建　荣 冈　庄越挺
　　　　陈 纯　鲍虎军　吴朝晖　陈耀武

▍Human Resources Committee
Director: Liu Xu　Vice- Director: Duan Huilong
Committee members:
Gu Peifu　　　Tong Limin　　Liu Xiangdong
Yan Xiaolang　Zhang Xianmin　Zhang Chaoyang
Sun Youxian　Zhang Hongjian　Rong Gang
Zhuang Yueting　Chen Chun　　Bao Hujun
Wu Zhaohui　　Chen Yaowu

▍教学委员会
主 任：何钦铭　副主任：丁慧敏
委 员：王晓萍　张光新　陈 越　陈根才　陈耀武
　　　　杨冬晓

▍Teaching Committee
Director: He Qinming　Vice- Director: Yu Huimin
Committee members:
Wang Xiaoping　Zhang Guangxin　Chen Yue
Chen Gencai　　Chen Yaowu　　　Yang Dongxiao

光电信息工程学系
Dept. of Optical Engineering

信息与电子工程学系
Dept. of Information Science & Electronic Engineering

控制科学与工程学系
Dept. of Control Science & Engineering

计算机科学与技术学院
College of Computer Science and Technology

生物医学工程与仪器科学学院
College of Biomedical Engineering & Instrument Science

软件学院
College of Software Technology

信息学部
Faculty of Information Technology

02

Talent Team
师资队伍

共有教职员工634人，其中教授151人，副教授284人；中国工程院院士3人，　　　　　　　教育部长江特聘教授7人，　　　　　　　　　浙江省特级专家4人，973首席科学家2人，杰出青年基金获得者10人，国家自然科学基金创新研究群体2个，教育部创新团队2个。

FIT comprises a staff of 634 , including 151 full professors, 284 associate professors. There are 3 members of the Chinese Academy of engineering, 7 Special-term professors　　　　　　　　specially engaged in the National Cheung Kong Scholar Program, 4 Senior Experts of Zhejiang Province. 　　　　2 national chief scientist of "973"project and 10 State Excellence Youth Science Foundation Fellows. 2 Innovative Research Groups of the Natural Science Foundation of China and 2 Innovative Research Teams of Ministry of Education were Constructed.

12.5%　　39.8%　　47.7%

教授 Prof
副教授 Associate Prof
讲师 Lecturer

教师职称结构
Professional Structure

▍新增 — 国家教育部"新一代微纳光子信息技术与工程应用"创新团队
New Generation Nanophotonic Information Technology and Engineering
Innovative Research Team of Ministry of Education

该团队由刘旭教授领衔，集光电系核心师资力量，围绕新一代微纳光子器件与工程应用开展研究，探索新一代微纳光子信息技术现象及效应、发展光学和光子学器件及技术、促进微纳光子学器件和技术的工程应用。

The team led by Prof. Liu Xu focus on the field of new generation nanophotonic devices and engineering. It is based on the key faculty of the Dept.of Optical Engineering. The task of the team is: trying to discover the new phenomena and effects in nanophotonics,to develop the new optical and photonical devices and technologies ,and to promote the nanophotonic devices and technologies into practical engineering applications.

2010年签约
Appointment in 2010

特聘专家 教授

骆季奎
Luo Jikui

高福荣
Gao Furong

仇旻
Qiu Min

付敏跃
Fu Minyue

杜一平
Du Yiping

罗明
Luo Ming

徐文
Xu Wen

朱豫才
Zhu Yucai

特聘专家 教授

俞滨
Yu bin

周武元
Zhou Wuyuan

Lorenz T Biegler

求是特聘教授
"Qiu Shi Program of ZJU" Professors

刘承
Liu Cheng

杜一平
Du Yiping

教育部新世纪优秀人才
MOE New Century Excellent Scholar Training Program Fellows

冯结青
Feng Jieqing

邵之江
Shao Zhijiang

池灏
Chi Hao

2010年报
Faculty of Information Technology
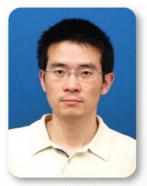Zhejiang University

2010年晋升
Promotion in 2010

教授
Professors

陈文智
Chen Wenzhi

吴 飞
Wu Fei

陈 曦
Chen Xi

陈积明
Chen Jiming

赵民建
Zhao Minjian

杜 阳
Du Yang

研究员
Researchers

金晓明
Jin Xiaoming

魏兴昌
Wei Xingchang

副教授
Associate Professors

时尧成
Shi Yaocheng

王 昊
Wang Hao

金小军
Jin Xiaojun

潘 赟
Pan Yun

匡翠方
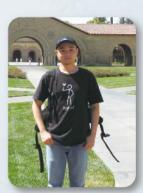Kuang Cuifang

张 涛
Zhang Tao

姜 伟
Jiang Wei

刘 勇
Liu Yong

王 锐
Wang Rui

2010年晋升
Promotion in 2010

副教授
Associate Professors

孙凌云
Sun Lingyun

唐志峰
Tang Zhifeng

李石坚
Li Shijian

田 翔
Tian Xiang

副研究员
Associate Researchers

夏永祥
Xia Yongxiang

任 重
Ren Zhong

高云君
Gao Yunjun

2010年新增导师
New Supervisors in 2010

博 导
Doctoral Supervisors

张冬仙	周柯江	李 凯	杨春节
Zhang Dongxian	Zhou Kejiang	Li Kai	Yang Chunjie
冯冬芹	孙建伶	陈 为	
Feng Dongqin	Sun Jianling	Chen Wei	

副博导
Associate Doctoral Supervisors

戴道锌	马慧莲	王浩刚	潘 翔
Dai Daoxin	Ma Huilian	Wang Haogang	Pan Xiang
宋春跃	陈 曦	陈卫东	潘 纲
Song Chunyue	Chen Xi	Chen Weidong	Pan Gang

硕 导
Master Supervisors

刘 崇	方 伟	张 磊	胡 骏
Liu Chong	Fang Wei	Zhang Lei	Hu Jun
史治国	余官定	李亚波	邓水光
Shi Zhiguo	Yu Guanding	Li Yabo	Deng Shuiguang
黄 劲	任 重	肖 俊	蔡 登
Huang Jin	Ren Zhong	Xiao Jun	Cai Deng
高云君	顾宗华	应放天	彭 韧
Gao Yunjun	Gu Zonghua	Ying Fangtian	Peng Ren
张 琳	张武明	沈国江	金 伟
Zhang Lin	Zhang Wuming	Shen Guojiang	Jin Wei
冯毅萍	周 凡	杨建华	
Feng Yiping	Zhou Fan	Yang Jianhua	

2010年新教师
New Teachers in 2010

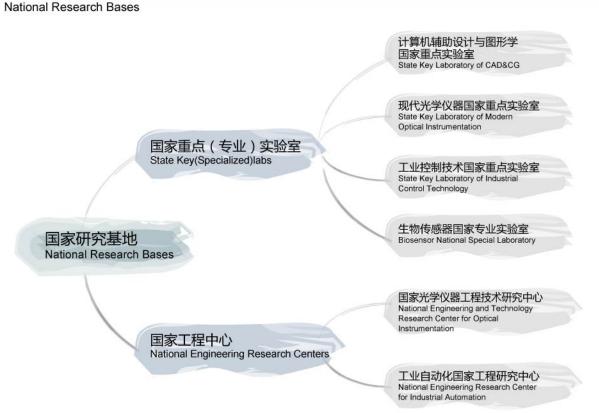| 许 超	杨秦敏	杨再跃	胡 冰
Xu Chao	Yang Qinmin	Yang Zaiyue	Hu Bing
魏兴昌	刘 英	潘 赟	夏永祥
Wei Xingchang	Liu Ying	Pan Yun	Xia Yongxiang
邓 宁	吴 婧	朱建科	孙凌云
Deng Ning	Wu Jing	Zhu Jianke	Sun Lingyun
邵 健	蒋 凯	田 翔	王 锐
Shao Jian	Jiang Kai	Tian Xiang	Wang Rui
时尧成	匡翠方	高云君	任 重
Shi Yaocheng	Kuang Cuifang	Gao Yunjun	Ren Zhong
侯启明	骆季奎	付敏跃	仇 旻
Hou Qiming	Luo Jikui	Fu Minyue	Qiu Min
杜一平			
Du Yiping			

Scientific Research
科学研究

科研概况

2010年到校科研经费总计4.28亿，其中纵向科研经费超过78%。共获国家自然科学基金项目76项（其中重点项目2项），总经费2423万元。共获国家科学技术进步奖二等奖3项，省部级科学技术奖4项，授权发明专利275项；SCI收录论文417篇，EI收录论文568篇，ISTP收录论文173篇。新增浙江省科技创新团队5个，浙江省重点实验室1个。

Scientific Research Survey

In 2010 ,the research funds of FIT accumulated to RMB 428 million in total, about 78% of which are from state foundation.FIT also got RMB 24.23 million with 76(2 key projects) projects from the Natural Science Foundation (NSF). 3 Second Award for National Science & Technology Progress, and 4 Awards for Provincial Science & Technology Progress, FIT has published more than 1100 indexed papers by SCI \EI\ISTP, together with 275 patents for invention. Besides, construction of 5 Innovation Teams of Zhejiang Province and 1 Key Laboratory named Optical & Electromagnetic Sensor Technology Research Lab of Zhejiang Province are approved in 2010.

国家研究基地
National Research Bases

- 计算机辅助设计与图形学国家重点实验室
  State Key Laboratory of CAD&CG
- 现代光学仪器国家重点实验室
  State Key Laboratory of Modern Optical Instrumentation
- 工业控制技术国家重点实验室
  State Key Laboratory of Industrial Control Technology
- 生物传感器国家专业实验室
  Biosensor National Special Laboratory

国家重点（专业）实验室
State Key(Specialized)labs

国家研究基地
National Research Bases

国家工程中心
National Engineering Research Centers

- 国家光学仪器工程技术研究中心
  National Engineering and Technology Research Center for Optical Instrumentation
- 工业自动化国家工程研究中心
  National Engineering Research Center for Industrial Automation

研究所
Institutes

院系 Department/College	研究所名称 Institute	所长 Director
光电信息工程学系 Dept. of Optical Engineering	光学工程研究所 Inst. of Optical Engineering	冯华君 Prof. Feng Huajun
	光电信息及检测技术研究所 Inst. of Optoelectronic Information Detection Technology	章海军 Prof. Zhang Haijun
	光电子技术研究所 Inst. of Optoelectronic Technology	沈永行 Prof. Shen Yonghang
	光电显示技术研究所 Inst. of Optoelectronic Display	刘 旭 Prof. Liu Xu
	光及电磁波研究中心 Center for Optical & Electromagnetic Research	何赛灵 Prof. He Sailing
	先进纳米光子学研究所 Inst. of Advanced Nanophotonics	仇 旻 Prof. Qiu Min
	光学惯性技术工程中心 Center for Optical Inertial Technology	刘 承 Prof. Liu Cheng
信息与电子工程学系 Dept. of Information Science and Electronic Engineering	信息与通信工程研究所 Inst. of Information & Communication Engineering	黄爱苹 Prof. Huang Aiping
	电子电路与信息系统研究所 Inst. of Electronic Circuit & Information System	沈继忠 Prof. Shen Jizhong
	电子信息技术与系统研究所 Inst. of Electronic Information Technology &System	李尔平 Prof. Li Erping
	微电子与光电子研究所 Inst. of Microelectronics and Optoelectronics	骆季奎 Prof. Luo Jikui
	微小卫星研究中心 Center for Microsatellite Research	金仲和 Prof. Jin Zhonghe
控制科学与工程学系 Dept. of Control Science and Engineering	工业控制研究所 Inst. of Industrial Process Control	孙优贤 Prof. Sun Youxian
	自动化仪表研究所 Inst. of Automation Instrumentation	张宏建 Prof. Zhang Hongjian
	智能系统与控制研究所 Inst. of Intelligent Systems and Decision Making	褚 健 Prof. Chu Jian
计算机科学与技术学院 College of Computer Science and Technology	人工智能研究所 Inst. of Artificial Intelligence	庄越挺 Prof. Zhuang Yueting
	计算机软件研究所 Inst. of Computer Software	陈 纯 Prof. Chen Chun
	计算机系统工程研究所 Inst. of Computer System and Architecture	吴朝晖 Prof. Wu Zhaohui
	工业设计研究所 Inst. of Modern Industrial Design	孙守迁 Prof. Sun Shouqian
生物医学工程与仪器科学学院 College of Biomedical Engineering & Instrument	生物医学工程研究所 Inst. of Biomedical Engineering	段会龙 Prof. Duan Huilong
	数字技术及仪器研究所 Inst. of Digital Technology & Instrument	陈耀武 Prof. ChenYaowu

科研亮点
Research Highlights

1. 承担国家重大科研任务
National Important Projects in progress

项目名称 Project	负责人 Director	院 系 Dept. & College
非结构化数据管理系统 Unstructured Database Management System	庄越挺 Zhuang Yueting	计算机科学与技术学院 College of Computer Science and Technology
神通大型通用数据库管理系统高 可用性研发及示范应用 High Availability Development & Application of Mass Universal Database Management System	陈 刚 Chen Gang	计算机科学与技术学院 College of Computer Science and Technology
混合现实的理论和方法 Theory and Approaches of Mixed Reality	鲍虎军 Bao Hujun	计算机科学与技术学院 College of Computer Science and Technology
智能手机嵌入式软件平台研发及产业化 R & D and industrialization of Smartphone Embedded Software Platform	陈天洲 Chen Tianzhou	计算机科学与技术学院 College of Computer Science and Technology
大学数字图书馆国际合作计划（CADAL） 技术支撑环境建设 Technical Supporting Environment Construction of CADAL（China Academic Digital Associate Library）	潘云鹤、庄越挺 Pan Yunhe， Zhuang Yueting	计算机科学与技术学院 College of Computer Science and Technology
浙江大学工业自动化国家工程研究中心 创新设计开发平台建设项目 Innovative Design & Development Platform Program, National Engineering Research Center of Industrial Automation, ZJU	孙优贤 Sun Youxian	控制系 Dept. of Control Science and Engineering
浙江省工业自动化公共科技创新服务平台 Industrial Automation Science and Technology Innovation Service Public Platform of Zhejiang Province	孙优贤 Sun Youxian	控制系 Dept. of Control Science and Engineering
流程工业能效分析与运行优化系统的开发与应用 Development and Application of Process Optimization and Process Operation System	苏宏业 Su Hongye	控制系 Dept. of Control Science and Engineering
水质安全评价与预警关键技术研发与应用示范 Research and Application of Water Quality Security Evaluation and Early-warning Technologies	张宏建 Zhang Hongjian	控制系 Dept. of Control Science and Engineering
仿真机器人感知控制高性能单元和系统 High Performance Perceive-control Units and Systems of Humanoid Robots	吴 俊 Wu Jun	控制系 Dept. of Control Science and Engineering
基于EPA的应用系统开发 Application System Development Based on EPA	黄文君 Huang Wenjun	控制系 Dept. of Control Science and Engineering
中国2010年上海世博会海宝智能服务型机器人设计制作运营 An Intelligent Service Robot—Haibao, Expo 2010 Shanghai China	熊 蓉 Xiong Rong	控制系 Dept. of Control Science and Engineering
轨道交通微机连锁系统开发 Railway Interlocking System Development	邱昕夕 Qiu Xinxi	生仪学院 College of Biomedical Engineering & Instrument Science

2. 科研成果奖
Research Achievements in 2010

❶ 面向现代服务业的钱塘支撑平台软件研制及产业化应用

该项目由计算机学院吴朝晖教授负责，获2010年国家科技进步二等奖。在多项国家、省部重大科技计划的支持下，针对现有平台软件难以满足快速发展的现代服务业对信息化建设提出的大规模、高动态、高融合的技术挑战，项目组通过近十年的产学研联合攻关，成功研制了钱塘平台软件，并成功应用在电子商务、金融证券、电信、公共服务等七大行业。项目成果具有自主知识产权，对改变国外相关厂商在平台软件领域常年垄断的局面、提升软件企业核心竞争力、促进我国现代服务业发展，具有重要作用。

The Development and Manufacturing of The Jtang Middleware Platform for Modern Service Industry

The project directed by Prof. Wu Zhaohui from College of Computer Science and Technology was awarded the National 2nd Prize of Sci & Tech Progress in 2010.The project team have succeed in the development and manufacturing of the Jtang Middleware Platform after almost a decade of hard work supported by national, ministerial and provincial scientific development plans.
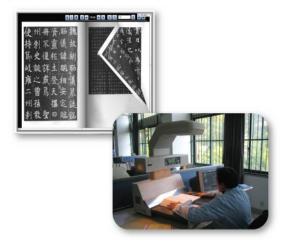The platform has been applied in seven different industries, including: e-commerce, financial securities, telecommunications and public services. The platform have solved many problems, which threatens the future of the entire modern services industry, where the requirements of scale, dynamics and integration are hardly met. The platform has independent intellectual property right. It's a great success because it not only changes the situation that foreign companies monopolized platform software, but also enhances the core competitiveness of software enterprises and simulates the development of modern service industry.

❷ 百万册数字图书馆的多媒体技术和智能服务系统

该项目由计算机学院庄越挺教授负责，获2010年国家科技进步二等奖。该项目创新性地提出了百万册图书和多媒体资源的组织、管理、检索、内容创新与服务等技术，有效地支撑了百万册数字图书馆的建设与服务，解决了百万册图书和海量多媒体资源如何"存储"，如何"检索"以及如何"使用"的问题。建成了包含100多万册数字图书和多媒体资源的开放性数字图书馆CADAL，成为国际上规模最大的公益性数字图书馆，提高了我国在数字图书馆领域的国际地位，产生了显著社会效益。

Multimedia Technology and Intelligent Service System of Million Books Digital Library

The project directed by Prof. Zhuang Yueting from College of Computer Science and Technology was awarded the National 2nd Prize of Sci & Tech Progress in 2010.The digital library team proposed the methods for the organization, management, retrieval, reasoning and service of million books and multimedia resources, effectively supporting the construction and services of millions books digital library, solving the problems on how to " store ", how to " search " and how to " use " of the resources of million books and mass media resources. They built an open digital library CADAL with million books and multimedia resources, which is one of the largest international non-profit digital libraries, raising China's international status in the field of digital libraries, and producing a significant social benefits.

③ 面向大规模城域监控的流媒体关键技术及装备

该项目由生仪学院陈耀武教授负责，获2010年国家科技进步二等奖。在"973"、"863"、自然基金和国家重大科技攻关项目的支持下，率先开展大规模城域监控系统关键技术的攻关，在自适应可伸缩编码、并发流媒体强容错、多源多尺度视频检索以及虚拟化网络存储等共性核心技术上取得突破，形成了一批具有国际水平的技术与装备。研制的系统已成功应用于深圳、天津等200多个平安工程建设，在平安工程建设中起到了重大作用。项目获授权发明专利32项，软件著作权13项，发表SCI论文20余篇。

Streaming Media Key Technologies and Equipments for Large Scale Video Surveillance System

The project directed by Prof. Chen Yaowu was awarded the National 2nd Prize of Sci & Tech Progress in 2010. With the support of National Research Plan ("973". 863". NSF and etc.), the project takes the lead in tackling the key technologies for large scale video surveillance system, and has made several breakthrough of some core techniques including adaptive scalable video coding, inter-current stream media error resilience, multi-source multi-scale indexing and virtual network storage, and finally a set of techniques and equipments with international level have been brought up. Up to the present, the system has been successfully applied to more than 200 Safety City Construction Projects which distributed in Shenzhen, Tianjin and etc., and played a great important role during these projects. Furthermore, the project has authorized 32 invention patents, acquired 13 software copyrights and has more than 20 papers index by SCI.

④ 面向重大工程的联合控制系统的研发及其应用

该项目由控制系金建祥教授负责，获2010年浙江省科学技术一等奖。面向重大工程的联合控制系统是浙江大学和浙江中控联合研究和开发的新一代控制系统。该系统面向流程工业大规模联合生产装置应用需求，在保证安全性、可靠性的基础上采用了开放、可叠加配置、控制分域、联合工程管理等柔性结构，取得了多项技术创新，项目成果达到国际先进水平。

The Research and Its Application of The New Generation Control System United Control System For Major Plant Project
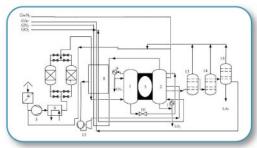
The project directed by Prof.Jin Jianxiang and finished jointly by ZJU and SUPCON was awarded Zhejiang Province 1st Prize of Sci & Tech. The system has satisfied the requirement of process industry large-scale joint production equipments. On the basis of safety and reliability, the system adopt the flexible structure with open, stack configuration, control partition, joint engineer management and etc. This system has already get number of technological innovation prize and achieved international leading level.
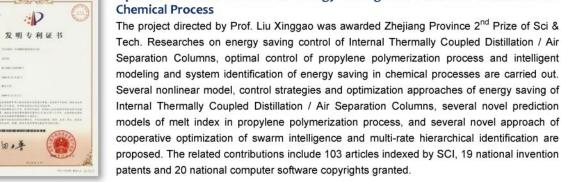
⑤ 高效节能减排化工过程优化控制理论与应用

该项目由控制系刘兴高教授负责，获2010年浙江省科学技术二等奖。在内部热耦合精馏节能控制、丙烯聚合优化控制、节能减排智能建模与系统辨识等方面开展理论与应用研究，提出了内部热耦合精馏/空分节能的多种非线性节能模型、先控方案和优化策略，多种高效新型丙烯聚合熔融指数预报模型，以及群智协同优化、多率递阶辨识等多种新方法，发表SCI论文103篇、授权国家发明专利19项、授权国家计算机软件著作权20项。

Optimization and Control of Energy Saving and Pollution Reduction for Chemical Process

The project directed by Prof. Liu Xinggao was awarded Zhejiang Province 2nd Prize of Sci & Tech. Researches on energy saving control of Internal Thermally Coupled Distillation / Air Separation Columns, optimal control of propylene polymerization process and intelligent modeling and system identification of energy saving in chemical processes are carried out. Several nonlinear model, control strategies and optimization approaches of energy saving of Internal Thermally Coupled Distillation / Air Separation Columns, several novel prediction models of melt index in propylene polymerization process, and several novel approach of cooperative optimization of swarm intelligence and multi-rate hierarchical identification are proposed. The related contributions include 103 articles indexed by SCI, 19 national invention patents and 20 national computer software copyrights granted.

⑥ 仿生嗅觉与味觉传感技术的研究

该项目由生仪学院王平教授负责，获2010年高等学校自然科学二等奖。项目组经过15年的深入持续的工作，从宏观和细胞与分子层面对仿生嗅觉与味觉的传感机理及设计进行了研究，通过对其敏感特性若干关键技术的摸索和实验，在疾病诊断和环境检测等领域进行了开创性应用。项目发表相关SCI收录论文87篇，论文被SCI刊物他人引用382次。

The Research of Biomimetic Olfactory and Gustatory Sensing

The project directed by Prof. Wang Ping was awarded the 2nd Prize of University Natural Science Progress. In recent 15 years, the group researched the sensing principle of biomimetic olfactory and taste sensors on the whole, from the cell and molecular level. Through the exploration and experiments of some key techniques, the group makes a series of applications using biomimetic olfaction and taste in diagnosis of disease and monitoring of environment. The group has published 87 papers in international journal which are cited 382 times by others.

⑦ 中药六类新药辛芙贴片的临床前研究

该项目生仪学院田景奎教授负责，获2010年浙江省科学技术三等奖。辛芙贴片是在深入研究临床有效验方的物质基础及生物活性基础上开发而成的经透皮给药的中药六类新药，是国内首个通过脐部给药治疗复发性口腔溃疡的外用片状膏药剂，具有疏风散热，降火等功效，对由脾胃蕴热、心火、虚火上炎所致的口腔溃疡、复发性口腔溃疡有良好的疗效。

Pre-clinical Research of Class VI New Traditional Chinese Medicine Xinyu Tiepian

The project directed by Prof. Tian Jingkui was awarded Zhejiang Province 3rd Prize of Sci & Tech . Xinyu Tiepian is transdermal delivery Class VI New Traditional Chinese Medicine based on deep research of the material basis of clinical effective prescription and biological activity, which is the first domestic external flake plaster through navel administration that cures recurrent oral ulcer. With many effects such as dispersing wind, clearing internal heat and downbearing fire, etc, it has a good effect on oral ulcers, recurrent oral ulcers caused by spleen and stomach heat, heart fire, vacuity fire flaming upward.

3. 工程应用研究
Progress in Engineering Application in 2010

① 我国首颗皮卫星——皮星一号A卫星成功搭载发射

2010年9月22日，信电系金仲和团队自主研制的两颗皮卫星——皮星一号A（ZDPS-1A）卫星在酒泉卫星发射中心成功搭载发射。ZDPS-1A卫星为15cm立方体体装式结构，重量3.5 kg，功耗3.5 W，主要用于皮卫星平台验证和MEMS、微型全景光学相机等技术试验。卫星由电源、S波段测控、指令执行单元、三轴稳定姿控、星务与有效载荷、结构与热控、星箭连接分离机构等部分组成，是我国首颗公斤级卫星，也是国际上功能最为齐全的皮卫星之一。

"ZDPS-1A"--China's first kg-level satellites

On Sep.22, 2010, two "ZDPS-1A", China's first kg-level satellites, were carried and launched into space successfully in Jiuquan satellite launch center. The satellites were wholly self-developed by the team led by Prof. Jin Zhonghe from the Dept. of Information and Electronic Engineering. As China's smallest satellite, the "ZDPS-1A", weighing 3.5 kilograms, has a cube shape with a side length of 15 centimeters and requires a working power source of only 3.5 watts. It is used to demonstrate the pico-satellite platform and verify advanced technologies such as MEMS and miniaturized optical hemispheric imaging. The satellite comprises the electrical power system (EPS), S band transponder, instruction execution unit (IEU), three-axis stabilization ADCS, on-board computer (OBC) and payloads, structure and thermal control subsystems, and the deployment structure.

② 嫦娥二号星载微小型光学镜头

由光电系徐之海、冯华君教授团队研制的星载微小型系列光学镜头成功应用于嫦娥二号太阳翼监视相机、定向天线监视相机、490N发动机监视相机和降落相机之中，在我国航天领域，首次实现了对卫星关键部件的关键动作监视成像和对地球与月球拍照，把充满梦幻的地月空间组照展示在国人面前，为嫦娥二号任务的顺利实施作出了重要贡献。

Micro Optical Lenses for Chang E-2 Satellite

The micro optical lenses developed by Professor Xu Zhihai & Feng Huajun's research team were successfully launched with the four optical self-surveillance CMOS cameras on Chang E-2, which was the forerunner satellite in the Second Phase of China Lunar Exploration Project. It was the first time in the history of China space exploration to monitor the key operations of satellite visually, and bring the splendid pictures to the public from the space between the Earth and the Moon. The micro optical lenses and CMOS cameras have made important contributions to the successful mission of CE-2.

③ 高性能虚拟现实支撑平台

基于计算机集群的高性能虚拟现实应用支撑系统可以应用于公众展示、城市规划、各类模拟器等领域，为大数据量场景在超高分辨率屏幕上的实时演示提供了完整的软硬件解决方案。该系统运行在高性能图形卡构成的计算集群上，通过自主开发的无缝拼接显示驱动，可以用投影机阵列在各种屏幕上投影显示无缝画面。可接入各类人机交互外设，并支持用户自行开发的实物界面。该平台在2010年世博会上得到了应用。

The High-performance VR Application Supporting System

This high-performance VR application supporting system provides an integrated solution to develop complex VR applications, such as public exposure, urban planning, simulation and science visualization, in which a large-scale complex dynamic scene will be displayed on an aligned multi-projector display wall. The system is supported by a PC-cluster with 20 nodes, which are equipped with high performance graphics cards. Through our seamless tiled screen display driver, the displays cast by 14 projectors form a seamless 360-degree stereo display on a cylindrical display wall. Meanwhile, the system can also integrate various VR human-computer interaction devices, such as 3D tracker, data gloves, touch screen, microphone, and so on, to support gesture and voice human-computer interactions. It also can be adapted to user-developed tangible UI.

④ 海宝机器人

受上海世博局委托，控制系联合中控研究院研发制作了2010上海世博会智能服务机器人"海宝"。作为一台人性化的机器人，"海宝"集成了多传感器信号采集、多关节运动规划与控制、人脸检测与识别、物体识别、语音识别、同步定位和地图构建、导航等多种先进技术，具备信息咨询、迎宾导游、自由聊天、拍照摄影、才艺表演五大功能，还能通过丰富的面部表情、多变的刘海颜色、结合身体各部位的动作和优秀的语言能力，表达它的想法和情绪。

An Intelligent Service Robot– Haibao

Commissioned by Shanghai World Expo Business Coordinated Bureau, the Department of Control Science and Engineering of ZJU, cooperating by Supcon Research Corporation, developed an intelligent service robot, Haibao, for the 2010 Shanghai World Expo. As a humanized robot, Haibao integrates great amount of advanced technologies, such as the data collection of varied sensors, motion planning and control of the multi-joints arm, face detection and recognition, object recognition, speech recognition, simultaneous localization and mapping, navigation, etc. It possesses five main service functions: information consultation, reception and guide, freely chat, photographing, talent show. Moreover, Haibao is able to express his feelings through rich facial expressions, color's change of the bang, body movements and outstanding linguistic competence.

⑤ 中国残疾人信息无障碍关键技术支撑体系及示范应用

计算机学院陈纯教授领衔的团队联合中国残疾人联合会、中国科学院、西安交通大学等单位，在"十一五"国家科技支撑计划重点项目"中国残疾人信息无障碍关键技术支撑体系及示范应用"等多个课题的支撑下，研发面向残疾人信息无障碍服务的关键技术基础支撑，解决我国残疾人事业信息无障碍服务领域发展初期在无障碍的信息获取、残疾人个性化的服务方式与服务流程定制、战略信息资源建设管理、残疾事业分析与优化决策中遇到的共性关键问题。同时，项目团队与中国残联合作成立了中国残疾人信息和无障碍技术研究中心，研发了一批残疾人信息无障碍技术和助老助残系列创新产品，为我国残疾人信息无障和残疾人事业信息化提供了关键技术支撑。

Key Information and Accessibility Technologies for Disabilities and Model Applications

The project team led by Prof. Chun Chen worked in collaboration with China Disabled Person's Federation (CDPF), Chinese Academy of Science and Xi'an Jiaotong University to develop information accessibility technology and products for disabled persons in China. The project mainly addresses challenges in information accessibility for disabled persons in China, including accessible information retrieval, personalized service customization for disabled, strategic information resource management and decision support etc. The project team jointly founded China Research Center of Information and Accessibility Technology for Disabilities with China Disabled Persons Federation, which mainly focuses on the research and development of information accessibility technologies and assistive products for the disabled and the elderly.

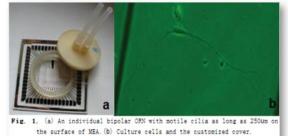---

4. 年度TOP论文
Recommended Papers of year

01. The Fabrication of an Olfactory Receptor Neuron Chip Based on Planar Multi-electrode Array and its Odor-response Analysis
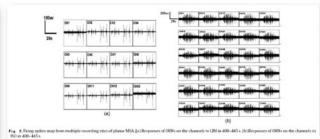
BIOSENSORS & BIOELECTRONICS 26(3), 2010
Ling SC; Gao TY; Liu J; Li YQ ; Zhou J; Li J; Zhou CC; Tu CL; Han F; Ye XS

该论文研制了一种基于嗅感觉神经元的新型神经芯片。通过实时记录两种不同浓度的气体定量通过神经芯片时神经元产生的胞外电信号得到气体响应特性。利用分类算法对响应特性进行分析，可以识别DL-苧烯和乙酸异戊酯两种气体，具有作为仿生电子鼻用以识别不同气体的前景。

A novel olfactory neurochip based on olfactory receptor neurons (ORNs) cultivated planar multielectrode array (MEA) devices was developed in this study. In order to investigate the odor-response characteristics of ORNs, two types of odorants at different concentrations were quantitatively pumped into the neurochip, and the extracellular electrical activities of multiple ORNs were simultaneously recorded in vitro. The odor-response features of ORNs such as firing amplitude, firing threshold were analyzed qualitatively and quantitatively. Especially, the odor-response maps from the multiple sites could be used to identify DL-limonene (LIM) and isoamyle acetate (ISO) odorants. These preliminary studies indicate that the ORN-based biosensor developed here has a potential capability of distinguishing different odorants as a true bionic electronic nose.

Fig. 1. (a) An individual bipolar ORN with motile cilia as long as 250um on the surface of MEA. (b) Culture cells and the customized cover.
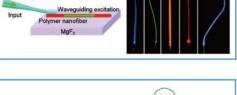
02. Light-Emitting Polymer Single Nanofibers Via Waveguiding Excitation
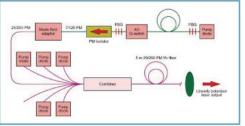
ACS NANO 4(9), 2010
Gu FX ;Yu HK ;Wang P; Yang ZY; Tong LM

通过溶液直接拉伸方法制备了高质量的染料掺杂高分子纳米光纤，使用倏逝波耦合输入和导波激发方式，在纳米光纤中获得了比普通照射激发高3个数量级的发光强度。通过荧光染料选择，获得了全光谱彩色和白光发光纳米线，在低功率的生物化学传感等纳米光子器件中具有潜在的应用前景。

Laser-dye-doped polymer nanofibers have been directly drawn from solvated polymers. Using evanescent coupling and waveguiding excitation, light emitting intensity enhancement of 3 orders of magnitude is obtained compared with conventional irradiation excitation. Full-color and white light emitting nanofibers are obtained by doping different dyes, which are promising for low-power photonic applications such as bio-chemical optical sensing.
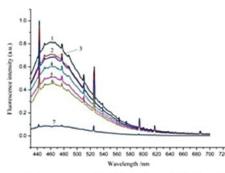
03.Pilot Study on Early Detection of Dental Demineralization Based on Laser Induced Fluorescence

Chen QG ; Lin B ; Chen ZB ; Zhu HH ; Chen H

论文研究光与牙齿组织的作用、传输与分布及牙本质的光学特性描述参数，以牙齿主要构成物—羟基磷灰石在403nm激发下的荧光特征光谱443nm和526nm为标准，通过光学建模计算及实验测试，获得牙釉质和牙本质的荧光特征光谱比率与脱矿程度的关系，建立了牙齿矿物质含量的荧光光谱定量评价指标，测试其最小激发光功率密度为141.5mW/cm2，为牙齿的早期病变定量诊断提供可靠的实验基础和理论依据。

Research focuses on the interaction of light and teeth tissues, light diffusion and optical properties of dentine. From the view of characteristic spectrum of hydroxyapatite, the main inorganic minerals of teeth, at 443nm and 526nm excited by 405nm, the relationship between fluorescence characteristic spectrum ratio of enamel and dentine and demineralization level is investigated based on optical modeling and experimental measurement. The quantitative fluorescence spectrum evaluation parameter of teeth mineral content is built and the corresponding minimum excited power density is measured to be 141.5mW/cm2. The work provides theoretical foundation and experimental evidence for early quantitative diagnosis of dental caries.

04.Extracellular Potentials Recording in Intact Olfactory Epithelium by Microelectrode Array for a Bioelectronic Nose

Liu QJ; Ye WW; Xiao LD; Du LP; Hu N; Wang P

人和动物都具有非常灵敏的嗅觉系统，可以感知众多的气味物质。我们将大鼠嗅上皮细胞与微芯片耦合，建立了一种新型的生物电子鼻。通过对嗅觉组织电生理的测量，达到检测气味的目的。本研究可以为生物嗅觉和人工仿生嗅觉研究提供了新方法。

Human beings and animals have sensitive olfactory systems that can sense and identify a variety of odors. The purpose of this study is to combine biological cells with micro-chips to establish a novel bioelectronic nose system for odor detection by electrophysiological sensing measurements. Electrophysiological activities of olfactory receptor neurons in intact epithelium were measured through the multi-channel recording system. The investigation of olfactory epithelium can provide more information of olfactory system for artificial olfaction biomimetic design.
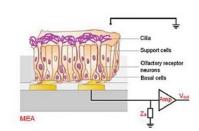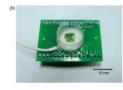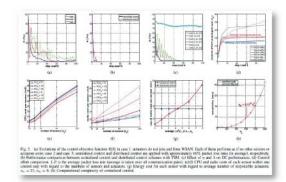

图1．微电极阵列对嗅黏膜上皮感受细胞胞外电位的记录

图2．微电极阵列芯片（a）与器件（b）

05.Interactive Hair Rendering Under Environment Lighting

Ren Z; Zhou K ; Li TF; Hua W ; Guo BN

头发是动画、游戏中表现虚拟角色的一个非常重要的元素，而由于其几何复杂性，头发的绘制一直是图形学中一个非常困难的问题，我们提出了一种新的环境光下的交互式头发绘制技术，通过光源分解和着色计算的分解将复杂的积分运算分离出来通过预计算来加速。实验证明我们的技术能在交互帧率下获得接近现有离线方法的绘制效果。

Hair is a vital element for the virtual characters in computer animations and games. Due to the complexity of hair geometry, rendering of hair has been a long stand difficult problem in computer graphics. We propose a novel interactive technique to render hair under environmental lighting, which decomposes the lighting and shading computation and accelerates complex integration via pre-computation. Experiments show our technique is able to generate, at interactive frame rates, high quality results comparable to those produced by existing offline method.

06.Building-Environment Control With Wireless Sensor and Actuator Networks: Centralized Versus Distributed
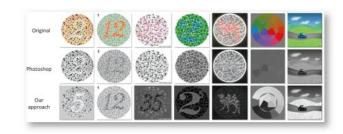
Cao XH; Chen JM; Xiao Y; Sun YX

本文研究基于无线传感器/执行器网络的智能楼宇环境控制系统，设计了集中式和分布式两种控制算法和相应的通信机制。分析显示两种算法的控制性能相当，但分布式算法在鲁棒性、计算复杂度和反应延迟上的表现更优。

This paper considers joined problems of control and communication in wireless sensor and actuator networks for building environment control systems. We develop a centralized control (CC) and a distributed control (DC) scheme, and also methods that enable wireless communications among devices compatible with the control strategies. We compare the two schemes in many aspects. The results show that the DC can achieve comparable control performance of the CC, while the DC is more robust against packet loss and has lower actuation latency as well as computational complexity than the CC.

07.Color to Gray: Visual Cue Preservation

Song ML; Tao DC; Chen C; Li XL; Chen CW

针对传统彩色−灰度转换存在的局限性，首次提出了体现人类视觉感知先验的视觉要素思想，并将其用于视觉信息提取。基于贝叶斯原理构造概率图模型，利用最大后验概率将所提取的视觉信息重定向到灰度级图像中，从而获得具有视觉细节更丰富的灰度图像，对图像理解、出版印刷、色盲患者的视觉信息获取无障碍技术中有重要意义。

In order to tackle the limitation of conventional color-to-gray transformation, a new concept of visual cue is presented based on human visual perception priors. Then based on the Bayesian Theorem, a probabilistic graphical model is constructed to retarget the extracted visual cues to the synthesized grayscale image, which is deduced to be a MAP problem and solved by using partial difference equation (PDE). The experimental results demonstrate that the proposed approach preserves more visual details than the existing technologies. In addition, the proposed technique can be widely employed in image understanding, publishing/printing, and the barrier-free access to visual information of the colorblind people
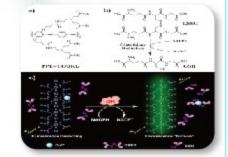
08.Fluorescence Turn-on Assay for Glutathione Reductase Activity Based on a Conjugated Polyelectrolyte with Multiple Carboxylate Groups

JOURNAL OF MATERIALS CHEMISTRY 20（48）,2010

Fan HL; Zhang T; Lv SW; Jin QH

本研究首次报道了一种带有多个羧基的新型荧光共轭聚电解质传感材料（PPE-(COOK)4），其在PBS缓冲液中是一种高灵敏、高选择性的荧光探针；在此基础上，进一步发展了谷胱甘肽还原酶（GR）的灵敏传感体系，检测下限为0.2 mU/mL，比目前的大多数分光光度法以及荧光法均灵敏许多，并且稳定性好。

A novel conjugated polyelectrolyte with multiple carboxylate groups (PPE-(COOK)4) has been designed as the sensitive and selective probe for Cu2+. And, a fluorescence turn-on assay of glutathione reductase has been developed with a LOD of 0.2 mU/mL, which is more sensitive and robust than most current methods.

09.RenderAnts: Interactive Reyes Rendering on GPUs

ACM TRANSACTIONS ON GRAPHICS 28（5）,2009

Zhou K; Hou QM; Ren Z; Gong MM; Sun X; Guo BN

我们设计并实现了RenderAnts，这是国际上第一个完全运行在GPU上的交互式Reyes绘制系统。在绘制质量相当的情况下，该系统比Pixar公司的基于CPU的电影绘制软件RenderMan快一个数量级。对于中等复杂的场景，RenderAnts能在生成真实照片画面的质量下，允许用户交互式地调整视点、光源和物体表面材质属性。

We present RenderAnts, the first system that enables interactive Reyes rendering on GPUs. Compared to Pixar's PRMan, our system can generate images of comparably high quality, but is over one order of magnitude faster. For moderately complex scenes, the system allows the user to change the viewpoint, lights and materials while producing photorealistic results at interactive speed.

5.新增科技创新团队和基地
Innovation Research Team and Key Lab Established in2010

■ 浙江省科技创新团队
Science & Technology Innovation Research Team of Zhejiang Province

团队名称 Innovation Research Teams	负责人 Leaders
基础平台软件 Basic Software Platform Innovation Research Team	吴朝晖 Prof. Wu Zhaohui
高新光电子器件及应用技术 Optoelectronic Devices & Application Technology Innovation Research Team	刘 旭 Prof. Liu Xu
数字多媒体技术 Digital Media Technology Innovation Research Team	陈耀武 Prof. Chen Yaowu
智能服务机器人技术及其产业化 Intelligent Service Robot Technology and Its Industrialization Innovation Research Team	褚 健 Prof. Chu Jian
工业过程及生产装备的先进控制 Advanced Control of Industrial Processes and Equipments Innovation Research Team	孙优贤、俞 立 Prof.Sun Youxian Prof. Yu Li

■ 浙江省光电磁传感技术研究重点实验室
Zhejiang Provincial Key Laboratory for Sensing Technologies

浙江省光电磁传感技术重点实验室由何赛灵教授领衔，依托光及电磁波研究中心，主要研究：（1）微纳光电生物传感技术；（2）分布式光纤传感器及复用技术；（3）自由空间光/电磁波传感技术。实验室致力于打造服务于浙江省光电磁传感技术相关产业的一流创新实验室及研究团队。

Zhejiang Provincial Key Laboratory for Sensing Technologies based in the Centre for Optical and Electromagnetic Research, is directed by Prof. He Sailing .Its main research areas are: (1) Micro-nano optoelectronics for bio-sensing; (2) Distributed fiber sensing and multiplexing technology; (3) Free space optical/electromagnetic sensing technology. The laboratory is committed to becoming an innovative top laboratory that can serve the relevant industries in Zhejiang Province.

Education
人才培养

学科
Disciplines

光学工程 Optical Engineering
光学工程 Optical Engineering
光通信技术 Optical Communication Technique

仪器科学与技术 Instrument Science and Technology
测试计量技术及仪器 Measuring and Testing Technologies and Instruments
电子信息技术及仪器 Electronic Information Technology and Instrument

电子科学与技术 Electronic Science and Technology
物理电子学 Physical Electronics
微电子学与固体电子学 Microelectronics and Solid-state Electronics
电路与系统 Circuits and Systems
电磁场与微波技术 Electromagnetic Field and Microwave Technology
集成电路设计 Integrated Circuits Design

信息与通信工程 Information and Communication Engineering
通信与信息系统 Communication and Information System
信号与信息处理 Signal and Information Processing

控制科学与工程 Control Science and Engineering
控制理论与控制工程 Control Theory and Control Engineering
检测技术与自动化装置 Detection Technology & Automation Equipment
系统工程 System Engineering
模式识别与智能系统 Pattern Recognition & Intelligent Systems
导航、制导与控制 Navigation, Guidance and Control

计算机科学与技术 Computer Science and Technology
计算机应用技术 Computer Application Technology
计算机软件与理论 Computer Software and Theory
计算机系统结构 Computer System Organization
数字化艺术与设计 Digital Art and Design
电子服务 Electronic Service
设计艺术学* Art of Design*
软件工程* Software Engineering*

生物医学工程 Biomedical Engineering
生物医学工程 Biomedical Engineering

*表示只有硕士点
* Only offer master program

本科专业
UG Program

院 系 Department/College	本科专业 UG Program
信息与电子工程学系 Dept. of Information Science and Electronic Engineering	信息与通信工程 Information and Communication Engineering
	电子科学与技术 Electronic Science and Technology
光电信息工程学系 Dept. of Optical Engineering	信息工程（光电） Information Engineering
控制科学与工程学系 Dept. of Control Science and Engineering	自动化 Automation
计算机科学与技术学院 College of Computer Science and Technology 软件学院 College of Software Technology	计算机科学与技术 Computer Science and Technology
	数字媒体技术 Digital Media
	工业设计 Industrial Design
	软件工程 Software Engineering
生物医学工程与仪器科学学院 College of Biomedical Engineering & Instrument Science	生物医学工程 Biomedical Engineering
	电子信息技术及仪器 Electronic Information Technology & Instrument Science

在校生（人）
Enrollments

院　系 Department/College	博士生 Doctor	硕士生 （全日制） Master	本科生 Undergraduate
光电信息工程学系 Dept. of Optical Engineering	176	283	426
信息与电子工程学系 Dept. of Information Science and Electronic Engineering	228	487	980
控制科学与工程学系 Dept. of Control Science and Engineering	182	399	442
计算机科学与技术学院 College of Computer Science and Technology	447	697	1068
生物医学工程与仪器科学学院 College of Biomedical Engineering & Instrument Science	160	260	486
软件学院 College of Software Technology		298	
合计 Total	1193	2415	3402

本年度招生数
Freshmen

院　系 Department/College	博士生 Doctor	硕士生 Master	本科生 Undergraduate
光电信息工程学系 Dept. of Optical Engineering	40	97	
信息与电子工程学系 Dept. of Information Science and Electronic Engineering	45	163	
控制科学与工程学系 Dept. of Control Science and Engineering	36	137	
计算机科学与技术学院 College of Computer Science and Technology	79	309	922
生物医学工程与仪器科学学院 College of Biomedical Engineering & Instrument Science	35	64	
软件学院 College of Software Technology		148	
合计 Total	235	918	

毕业生（人）
Graduates

院　系 Department/College	博士生 Doctor	硕士生 Master	本科生 Undergraduate
光电信息工程学系 Dept. of Optical Engineering	33	71	109
信息与电子工程学系 Dept. of Information Science and Electronic Engineering	25	160	288
控制科学与工程学系 Dept. of Control Science and Engineering	27	105	130
计算机科学与技术学院 College of Computer Science and Technology	60	281	231
生物医学工程与仪器科学学院 College of Biomedical Engineering & Instrument Science	15	64	221
软件学院 College of Software Technology		141	143
合计 Total	160	822	1122

2010新增国家精品课程
New National Excellent Course in 2010

课　程：用户体验与产品创新设计　　Course：User Experience and Product Innovation Design
负责人：许喜华　　　　　　　　　　Leader：Xu Xihua
院　系：计算机科学与技术学院　　　College：College of Computer Science and Technology

《用户体验与产品创新设计》是一门重要的设计基础课程，它以用户为中心，研究用户体验与产品创新理论与方法、技术的人性面与反人性面的双重联结，使学生掌握如何根据市场的种种需求来整合适当的科技成果支撑，从而创造出新产品和新服务的知识与能力。

"User experience and products innovation design" is one of important design foundation courses. Based on user-centered, it explores the new theory and method of user experience and products innovation, the coupling between the humanity and anti-humanity of technology, and has student master how to integrate appropriate technology achievement and create new product and service according to the market requirement.

课　程：计算机游戏程序设计　　Course：Computer Game Programming
负责人：耿卫东　　　　　　　　Leader：Geng Weidong
院　系：计算机科学与技术学院　College：College of Computer Science and Technology

《计算机游戏程序设计》是浙江大学数字媒体技术专业在游戏人才培养目标方面的最核心课程之一，也是学生接触和进入游戏产业的最基础课程之一。它基于学生对"游戏"的好奇心和兴趣，逐步引导他们把游戏开发所涉及的基础知识融会贯通，由点及面地逐步掌握游戏开发的高级技能，最终在游戏开发方面形成专长。

"Computer Game Programming" is one of the core compulsory subjects in the specialism of digital media technology. Its major objective is to provide fundamental knowledge of game development and a systematic training of game programming skills for the students and pave their way to enter into the game industry after they graduate.

课　程：微机原理与接口技术　　Course：Principle and Interface of Microprocessors
负责人：王晓萍　　　　　　　　Leader：Wang Xiaoping
院　系：光电信息工程学系　　　Department：Dept. of Optical Engineering

《微机原理与接口技术》是计算机技术的硬件基础课程之一，通过该课程的学习使学生从理论和实践上掌握微型计算机的工作原理和基本组成，熟悉微机的汇编指令体系及汇编程序设计方法，以及常用接口技术及其软硬件设计方法，建立微机系统的整体概念，达到初步具有微机应用系统的软硬件设计、开发能力。

"Principle and Interface of Microprocessors" is one of the basic hardware courses of computer technology. From the course, students can master the fundamental composition and working principle of microcomputer, get familiar with assembly repertoire and program design methods as well as software and hardware development of common interface technology, and set up the global conception of microprocessor system. Thus students can acquire the elementary ability of software and hardware design and development.

2010新增国家规划教材
National Level Official Textbook in 2010

序号 No.	教材名称 Name	主　编 Chief Editor	出版社 Press
1	用户体验与产品创新设计 User Experience and Product Innovation Design	罗仕鉴 Luo Shijian	机械工业出版社 China Machine Press
2	电子服务及实践 Electronic Services and Practice	陈德人 Chen Deren	电子工业出版社 Publishing House of Electronic Industry
3	嵌入式系统原理与设计 Embedded System Principles and Design	陈文智 Chen Wenzhi	清华大学出版社 Tinghua University Press
4	电子商务实务 Electronic Commerce Practice	陈德人 Chen Deren	高等教育出版社 Higher Education Press
5	服务科学：基础、挑战和未来发展 Service Science: Fundamentals, Challenges and Future Developments	吴　健 Wu Jian	浙江大学出版社 Zhejiang University Press
6	控制系统的数字仿真及计算机辅助设计 The Digital Simulation and CAD of Control System	钱积新 Qian Jixin	化学工业出版社 Chemical Industry Press

2010国际学科竞赛奖
International Disciplinary Competition in 2010

竞赛名称 Competition	奖 项 Award	获奖名单 Awards List
2010年国际大学生 程序设计竞赛亚洲赛区 ACM International Collegiate Programming Contest Asia Region (ACM-ICPC)	天津赛区 金牌 Gold Medal, Tianjin site	NFA队：范雨喆 庄俊元 VPN队：梁嘉兴 李飞
	天津赛区 铜牌 Bronze Medal, Tianjin site	Square队：吴峻 万信逸 沈鑫
	杭州赛区 金牌 Gold Medal, Hangzhou site	Resolution队：陈章义 姜凯 黄乔 NFA队：范雨喆 庄俊元
	杭州赛区 铜牌 Bronze Medal, Hangzhou site	VPN队：梁嘉兴 李飞
	福州赛区 金牌 Gold Medal, Fuzhou site	ArcOfDream队：巫泽俊 欧阳嘉林
	福州赛区 银牌 Silver Medal, Fuzhou site	Resolution队：陈章义 姜凯 黄乔
	河内赛区 冠军 Champion, Hanoi site	ArcOfDream队：巫泽俊 欧阳嘉林
2010年德国红点概念设计大赛 International Design Competition 'Red Dot Design Award'	红点设计概念奖 (6项) Design Concepts Award	作品Pannel Bin：邱懿武等八人 作品Standing Roller：孙欣等八人 作品Touch Reader：叶新等五人 作品Home of Firefly：李琼等三人 作品Keep It：王瓅珏等四人 作品Light Gap：魏呈远等十人
2010年德国IF设计大赛 2010 International IF Design Competition	IF材料趋势设计大奖 (4项) IF Material Trends Award	"Transformable Mat"浙江大学 创新团队：陶骏等十人 "Bamboo O-pen"浙江大学 创新团队：陶骏等十人 "Acid-Umbrella"浙江大学 创新团队：孙欣等九人 "Utape"浙江大学 创新团队：彭俊杰等五人
	IF概念设计奖 IF Concept Award	"Easy Needle"浙江大学 创新团队：杜锐等四人
2010年第十四届RoboCup机器人 世界杯比赛 The 14th Robot World Cup (RoboCup 2010)	救援仿真组季军 The 3rd Prize, Rescue Leagues	李俊堃等二人
	仿人组前八 Top 8, Humanoid Leagues	李深等二人
2010年国际大学生数学建模竞赛 2010 Interdisciplinary Contest In Modeling (ICM)	特等奖 Outstanding Winner (SIAM Award)	赵聪
	一等奖 The 1st Prize	宋昭等八人

2010国内学科竞赛奖
Civil Disciplinary Competition in 2010

竞赛名称 Competition	级 别 Level	奖 项 Award	获奖名单 Awards List
2010年中国机器人大赛暨 RoboCup公开赛 China Robot Competition and the RoboCup China Open	国家级 National	仿人组冠军 Champion, Humanoid Leagues	李深等六人
		小型组亚军 Runner-up, Small Size Leagues	马月等五人
2010年全国大学生数学建模竞赛 China Undergraduate Mathematical Contest in Modeling	国家级 National	一等奖 The 1st Prize	陈鑫磊等四人
		二等奖 The 2nd Prize	周锐等六人
	浙江省 Zhejiang Province	一等奖 The 1st Prize	赵前程等七人
		二等奖 The 2nd Prize	喻梦捷等六人
		三等奖 The 3rd Prize	黄堃等五人
第二届全国光电设计竞赛 The 2nd National University Students' Opt-electronic Design Competition	国家级 National	二等奖 The 2nd Prize	倪晓烽等六人
		三等奖 The 3rd Prize	杜昕鹏等四人
2010浙江省大学生多媒体设计竞赛 2010 Zhejiang Province Undergraduate Multimedia Design Competition	浙江省 Zhejiang Province	二等奖 The 2nd Prize	陈烨等三人
浙江省第七届大学生程序设计竞赛 The 7th Zhejiang Province Undergraduate Programming Contest	浙江省 Zhejiang Province	特等奖 Outstanding Award	商泽超
		一等奖 The 1st Prize	欧阳嘉林等二人
		二等奖 The 2nd Prize	晁建嵩等六人
2010全国大学生化工设计竞赛 2010 National Undergraduate Chemical Engineering Design Competition	国家级 National	特等奖 Outstanding Award	浙江大学VIVO 团队：崔晓红等
浙江省第七届大学生机械设计竞赛 The 7th Zhejiang Province Undergraduate Mechanical Design Competition	浙江省 Zhejiang Province	一等奖 The 1st Prize	欧肖泽

2010专项奖
Special Awards in 2010

序号 No.	获奖学生 Winners	奖 项 Award	院 系 Department/College
1	刘 奇 Liu Qi	浙江大学2009-2010学年 竺可桢奖学金 Chu Kochen Scholarship	信息与电子工程学系 Dept. of Information Science and Electronic Engineering
2	孙 硕 Sun Shuo	浙江大学2009-2010学年 竺可桢奖学金 Chu Kochen Scholarship	光电信息工程学系 Dept. of Optical Engineering
3	胡均松 Hu Junsong	浙江大学2009-2010学年 竺可桢奖学金 Chu Kochen Scholarship	生物医学工程与仪器科学学院 College of Biomedical Engineering & Instrument Science
4	宋俊潇 Song Junxiao	浙江大学2009-2010学年 竺可桢奖学金 Chu Kochen Scholarship	控制科学与工程学系 Dept. of Control Science and Engineering
5	谢 丹 Xie Dan	浙江大学2009-2010学年 竺可桢奖学金 Chu Kochen Scholarship	软件学院 College of Software Technology

2010本科生深造与对外交流
Further Studies and International Exchange in 2010

院系名称 Department/College	出国深造人数 Further Study Aboard	出国深造率 Ratio of Further Studies Aboard	读研人数（本校和外校） Further Study at Home	读研率 Ratio of Further Study at Home	对外交流人次（本科生） International Exchange (UG Programs)
光电信息工程学系 Dept. of Optical Engineering	17	21.3%	33	41.3%	29
信息与电子工程学系 Dept. of Information Science and Electronic Engineering	53	21.2%	87	34.8%	51
控制科学与工程学系 Dept. of Control Science and Engineering	41	31.5%	57	43.8%	31
计算机科学与技术学院 College of Computer Science and Technology 软件学院 College of software Technology	51	14.53%	135	38.46%	42
生物医学工程与仪器科学学院 College of Biomedical Engineering & Instrument Science	41	18.6%	87	39.4%	30

院系设立的奖学金
Scholarships of Department/College

院系名称 Department/College	奖学金名称 Scholarship	获奖人数 Awarded Number
光电信息工程学系 Dept. of Optical Engineering	聚光奖学金 "Gemcore" Scholarship	15
	敏通奖学金 "Mintron" Scholarship	5
	舜宇奖学金 "Sunny" Scholarship	78
计算机科学与技术学院 College of Computer Science and Technology 软件学院 College of Software Technology	"视易之星"奖学金 "Shiyi Star" Scholarship	10
	"湘瑞教育"奖学金 "Xiangrui Education" Scholarship	5
	中加双学位班奖学金 China-Canada Double Degree Scholarship	18
	何志均教育基金奖学金 He Zhijun Education Foundation Scholarship	10
	Google优秀奖学金 Google Excellent Scholarship	5
	Google Anita Borg计算机女性奖学金 Google Anita Borg Computer Female Scholarship	6
	软件、数字媒体基地奖学金 Software, Digital Media base Scholarship	160
信息与电子工程学系 Dept. of Information Science and Electronic Engineering	ISEE荣誉奖 ISEE Honor Award	10
	ISEE创新奖 ISEE Innovation Award	9
	ISEE新人奖 ISEE New Investigator Award	50
	ISEE单项贡献奖 ISEE Contribution Award	10
	ISEE助学金 ISEE Grant	10
	福建海西奖助学金 Fujian Haixi Scholarship and Grant	2
	ISEE-浙大信电—德州仪器大学生奖助学金 Texas Instruments Scholarship and Grant	10
生物医学工程与仪器科学学院 College of Biomedical Engineering & Instrument Science	浙大生仪—德州仪器大学生奖助学金 BEIS-Texas Instruments Scholarship and Grant	20
控制科学与工程学系 Dept. of Control Science and Engineering	春晖奖学金 "Chunhui" Scholarship	6
	温持祥奖学金 "Wen Chixiang" Scholarship	18
	E+H奖学金 E+H Scholarship	10

International Exchange and Cooperation
海外交流

海外交流概况
International Exchange and Cooperation

　　学部本年度教师出访参加学术会议、合作交流230人次左右，接待130多人次国外学者来访进行学术交流，举办国际会议4次。按照与日本早稻田大学签订的学生交流备忘录，推荐2名学生前往早稻田大学IPS学院攻读硕士学位，并有七位师生参加了早稻田大学举办的2010国际合作专题研讨会。各院系与国外著名大学签订了多项学生联合培养及教师科研合作项目。

About 230 teachers visited abroad for academic conference and the cooperation research. More than 130 world-renowned scholars have been invited to visit FIT for lectures and academic communication. It hosted about 4 international conferences successfully. According to the student exchange memorandum of understanding between FIT and IPS of Waseda University, two students of FIT were recommended to IPS for Master Degree, and 7 teachers and students from FIT attended the 4th IPS International Collaboration Symposium 2010 held by IPS of Waseda University. Several student exchanges and cooperation research programs were signed between the college/department of FIT and famous universities.

主办国际会议
Host International Conferences

1、2010年国际电磁研究进展大会
Progress in Electromagnetics Research Symposium (PIERS 2010)

　　3月22日至25日，由浙江大学、西北工业大学、美国麻省理工学院和国际电磁科学院共同主办、西北工业大学承办的国际电磁研究进展大会在西安召开。会议设电磁理论、天线、微波遥感、计算电磁等五十多个分会场，600多位专家和学者出席了会议，其中包括来自近50个国家的300多名海外学者及20多位IEEE会士。

The Progress in Electromagnetic Research Symposium (PIERS, 2010) was held on March 22-25 in Xi'an, hosted by Department of Information Science &Electronic Engineering of ZJU, Northwestern Polytechnical University, MIT and International Electromagnetics Academy. There were more than 50 seminars, such as electromagnetic theory, antennas, microwave remote sensing, computational electromagnetics, and so on. Almost 600 experts attended the conference, including more than 300 overseas scholars from nearly 50 countries and 20 IEEE Fellows.

2、英国约克大学与浙江大学联合学术研讨会
Joint Symposium between York University and Zhejiang University

　　由浙江大学信电系主办的英国约克大学与浙江大学联合学术研讨会于2010年4月12日至14日在浙江大学召开。会议期间，成立了"约克大学－浙江大学认知网络与绿色通信实验室"，以拓展和强化约克大学与浙江大学在未来信息通信技术关键领域、特别是在认知网络与绿色通信方面的高层次、实质性、长期和双赢的国际合作。

2010 Joint Symposium between York University and Zhejiang University, which is hosted by Department of Information Science &Electronic Engineering of ZJU, was convoked smoothly on April 12-14 at Yuquan Campus of Zhejiang University (ZJU). During the meeting, the York-Zhejiang Lab for Cognitive Radio and Green Communications was established to expand and strengthen the win-win international cooperation in the key areas of future information communication technology, especially in the perception network and green communications

3. 2010服务科学国际会议
2010 International Conference on Service Sciences

5月12日到5月14日，2010年服务科学国际会议在杭州举行。本次会议由IBM公司，浙江大学和中国科学院软件研究所共同承办。会议的宗旨是促进全球服务科学领域的教授学者进行广泛的学术交流，促进服务科学领域的成长扩大。

2010 International Conference on Service Sciences was held successfully in Hangzhou . It was hosted by IBM, Zhejiang University and Institute of Software of Chinese Academy of Sciences. The meeting aims to promote academic communication of global scholar in the field of service science and the growth of service science sphere.

4、第18届太平洋图形学国际会议
The 18th Pacific Conference on Computer Graphics and Applications PG 2010

2010年9月25－27日，第18届太平洋图形学国际会议在浙江大学邵逸夫科学馆举行，大会录用的31篇正式报告论文发表在国际重要学术刊物《Computer Graphics Forum》。

The 18th Pacific Conference on Computer Graphics and Applications PG 2010 was held in Hangzhou on September 25-27, 2010. There were 180 paper submissions, and 31 papers were selected for full oral presentation at the conference, as well as for inclusion in a special issue of Computer Graphics Forum.

2010 News
2010要闻

1. 制定信息学部"十二五"发展规划
"The 12th Five-Year"Development Plan of FIT was composed.

2. 8月28日，信息学部教育教学研讨会举行，探索教育改革和创新人才培养途径。
On August 28, seminar on educating and teaching of FIT was held to explore the development ways of education reform and training Innovation talent.

3. 3月25日，信息学部2010届研究生春季毕业典礼暨学位授予仪式举行。
On March 25，graduation and degree ceremony of postgraduate of FIT was held.

4. 5月12日，信息学部青年教师论坛启动，举行了第一次学术研讨会，并建立了青年教师论坛网站。
On May 12, the Young Teacher Forum of FIT was established and its web was set up ,Also，its first academic symposium was held simultaneously.

5. 由刘旭为负责人的信息学部先进传感器研究平台成立。
Advanced Sensor Research Platform directed by Prof. Liu Xu was set up

6. 依托信息学部，联合全省28家相关企业、高校，由鲁东明教授担纲，积极筹建浙江省物联网产业技术创新联盟。
Relying on FIT, IOT Industries and Technologies Innovation Alliance of Zhejiang province, for which Prof. Lu Dongming is responsible together with 28 relevant enterprises & universities ,were explored and promoted to construct in great effort.

7. 光学惯性技术工程中心获"十一五"科技计划执行优秀团队奖
Center for Optical Inertial Technology was awarded the outstanding team for national science and technology program from 2006 to 2010.

8. 光电系刘承教授获全国先进工作者荣誉称号
Prof. Liu Cheng from Dept. of Optical Engineering received the honor of National Advance Worker

9. 光电系徐之海获"十一五"科技计划执行突出贡献奖
Prof. Xu Zhihai from Dept. of Optical Engineering was awarded the outstanding contributor for national science and technology program from 2006 to 2010.

浙江大学信息学部

编　后

无数次的推敲，许多回的琢磨，思想和理念的碰撞，力量与智慧的凝聚，信息学部办公室主编的《Annual Report 2010》终于脱稿了！

素材的搜集，文字的斟酌，版面的谋划，风格的确定……点点滴滴，凝聚了团队全体成员的辛勤和努力。

感谢同事们的用心，感谢领导们的关心，感谢老师们的支持，感谢各院系的帮助……文稿付梓之际，太多的想说怎一个"谢"字能表达？面对着这本小册子——《Annual Report 2010》，灿烂的心情怎一个"乐"字可概括？所有的辛苦化作了甜蜜的微笑，所有的劳累均成为快乐的源泉……

期待着，我们期待着信息学部一年年的成就，引领着社会进步，致力于国家富强；眺望着，我们眺望着信息学科一步步的奋进，自立在民族之林，跻身于世界一流……

编　者
2011年5月于老和山下