



浙江大学信息学部
FACULTY OF INFORMATION TECHNOLOGY,
ZHEJIANG UNIVERSITY



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浙江大学
信息学部
Faculty of Information Technology
Zhejiang University

Annual Report 2011 年报

Annual Report 2011
Faculty of Information Technology
Zhejiang University

学部概况

Introduction to FIT

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9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，3个国家工程研究中心，共有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 9 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 research of Science issues and innovation of technical problem in the area of information technology.



学部主任：刘旭
Dean: Liu Xu



学部副主任：荣冈
Vice-Dean: Rong Gang



学部副主任：鲍虎军
Vice-Dean: Bao Hujun

Annual Report 2011

Faculty of Information Technology
Zhejiang University

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 浙江大学
信息学部

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 李尔平
张仲非 张宏建 荣冈 庄越挺 陈纯
孙守迁 吴朝晖 周昆 段会龙 陈耀武

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Committee members:
He Sailing Tong Limin Liu Cheng
Yan Xiaolang Li Erping Zhang Zhongfei
Zhang Hongjian Rong Gang Zhuang Yueting
Chen Chun Sun Shouqian Wu Zhaohui
Zhou Kun Duan Huihong Chen Yaowu

学位委员会

主任: 鲍虎军 副主任: 杜一平
委员: 白剑 仇旻 徐文 杨建义
张光新 宁钢民 何钦铭 陈刚
何湘宁 许正平 鲍世宁

Academic Degrees Committee

Director: Bao Hujun Vice-Director: Du Yiping
Committee members:
Bai Jian Qiu Min Xu Wen
Yang Jianyi Zhang Guangxin Ning Gangmin
He Qinming Chen Gang He Xiangning
Xu Zhengping Bao Shining

人力资源委员会

主任: 刘旭 副主任: 段会龙
委员: 刘承 童利民 刘向东 严晓浪 章献民
张朝阳 孙优贤 张宏建 苏宏业 庄越挺
陈纯 鲍虎军 吴朝晖 陈耀武

Human Resources Committee

Director: Liu Xu Vice-Director: Duan Huihong
Committee members:
Liu Cheng Tong Limin Liu Xiangdong
Yan Xiaolang Zhang Xianmin Zhang Chaoyang
Sun Youxian Zhang Hongjian Su Hongye
Zhuang Yueting Chen Chun Bao Hujun
Wu Zhaohui Chen Yaowu

教学委员会

主任: 荣冈 副主任: 陈越
委员: 王晓萍 张光新 何钦铭 黄海 杨冬晓
于慧敏

Teaching Committee

Director: Rong Gang Vice-Director: Chen Yue
Committee members:
Wang Xiaoping Zhang Guangxin He Qinming
Huang Hai Yang Dongxiao Yu Huimin

信息学部

Faculty of Information
Technology

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

Talent Team 师资队伍

教教职工643人, 其中正高156人, 副高291人。有中国工程院院士3人,

教育部长江特聘教授7人,

973首席科学家3人, 国家自然科学基金杰出青年获得者11人。国家自然科学基金创新群体2个, 教育部创新团队2个。

2011年新增 国家级高等学校教学名师1人, 973首席科学家1人, 全球杰出青年创新人物1人, 何梁何利基金“科学与技术创新奖”1人, 国家自然科学基金杰出青年获得者1人, 浙江省特级专家1人, 教育部新世纪优秀人才3人。

FIT comprises a staff of 643, including 156 full professors, 291 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, 5 Senior Experts of Zhejiang Province, 3 national chief scientist of National '973' Program and 11 State Excellence Youth Science Foundation Fellows. 2 Innovative Research Groups of the NSF China and 2 Innovative Research Teams of Ministry of Education have been constructed.

In 2011, Five professors are awarded the outstanding honors, including 1 as University Distinguished Teacher, 1 as '973' chief scientist, 1 as world's top 35 young innovators, 1 as Sci & Tech Innovation Award of Ho Leung Ho Lee Foundation winner and 1 as National Outstanding Youth Foundation of NSFC. Besides, 1 Senior Expert of Zhejiang Province, 3 faculty members were engaged in the training plan for MOE New Century Talents.

2011年新增
Awarded in 2011

专家 教授



钟健辉
Zhong Jianhui



王曦
Wang Xi



师资队伍职称结构
Professional Structure

973首席科学家
Chief Scientist of National "973" Program



庄越挺
Zhuang Yueting

国家级教学名师
University Distinguished Teacher



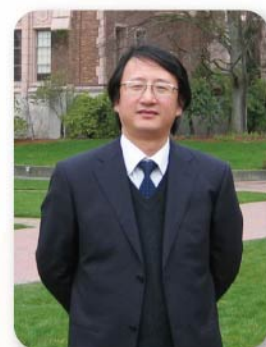
刘旭
Liu Xu

杰出青年基金获得者
State Excellence Youth Science Foundation Fellow



何晓飞
He Xiaofei

浙江省特级专家
Senior Expert of Zhejiang Province



吴朝晖
Wu Zhaohui

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



陈积明
Chen Jiming



吴飞
Wu Fei



马云贵
Ma Yungui

教授
Professors



戴道铨
Dai Daoxin

郑臻荣
Zheng Zhenrong



陈红胜
Chen Hongsheng



潘纲
Pan Gang

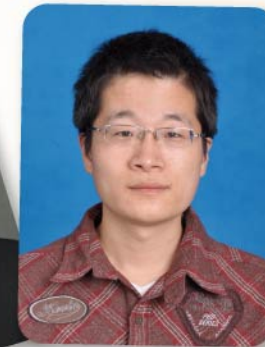


吕旭东
Lv Xudong

副教授
Associate Professors



钱骏
Qian Jun



金毅
Jin Yi

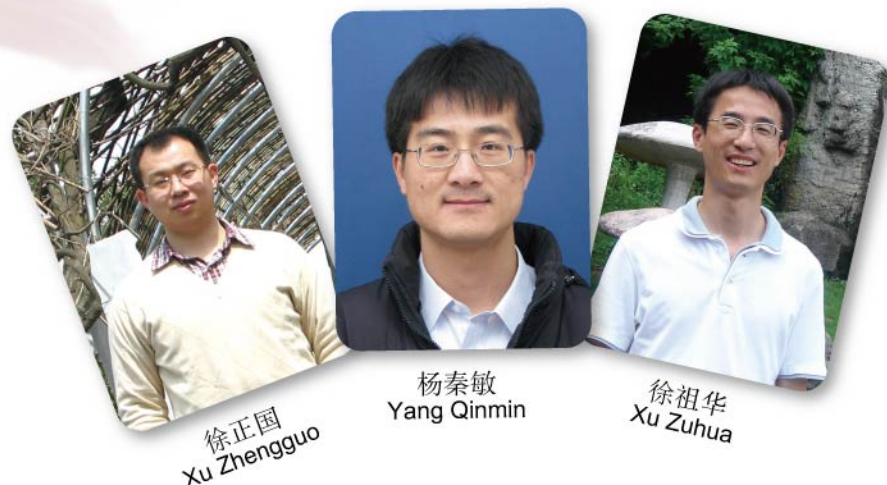
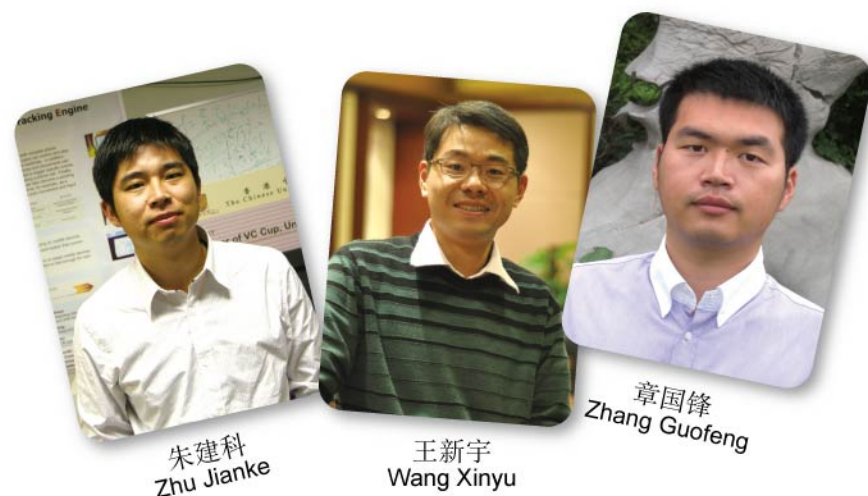


王玮
Wang Wei

黄凯
Huang Kai

徐扬
Xu Yang

副教授 Associate Professors

徐正国
Xu Zhengguo杨秦敏
Yang Qinmin徐祖华
Xu Zuhua朱建科
Zhu Jianke王新宇
Wang Xinyu章国锋
Zhang Guofeng

引进教师 New Teachers

朱豫才 葛志强 罗明 钱骏 陈杏藩 张秀达 李强 马云贵 单杭冠 郝然
蔡云龙 黄凯 王春晖 刘义冬 戴高乐 钟财军 汪小知 徐雯洁 章国锋 伍赛

Zhu Yucai Ge Zhiqiang Luo Ming Qian Jun Chen Xingpan Zhang Xiuda Li Qiang Ma Yungui
Shan Hangguan Hao Ran Cai Yunlong Huang Kai Wang Chunhui Liu Yidong Dai Gaole
Zhong Caijun Wang Xiaozhi Xu Wenjie Zhang Guofeng Wu Sai

Scientific Research

科学研究

科研概况

2011年到校科研经费逾4.5亿元，纵向经费占70%，其中获国家自然科学基金资助80项，合计经费4544万元，经费比2010年增长了87%。在研千万级项目6项，新增973项目2个，自然科学基金委重点项目2项；据不完全统计，2011年SCI收录论文527篇，其中影响因子5.0以上的论文有12篇；获国家授权发明专利逾300项；获国家科技进步奖二等奖1项，省部科学技术一等奖2项、二等奖2项；新增国家工程技术研究中心1个，浙江省重点实验室1个，浙江省科技创新团队2个。

Scientific Research Survey

The total research funding of FIT in 2011 reached over 450 million RMB, about 70% of which from the state government. FIT got 80 projects from NSF China with 45.44 million RMB in total. 527 published papers are indexed by SCI together with 300 patents of invention registered. FIT got 1 Second Award for National Sci& Tech Progress, and 4 first Awards for Provincial-grade Sci & Tech Progress. It has 6 Grant National Projects in progress, with over ten million RMB each, 2 national "973" programs and 2 key project of NSFC. Furthermore, FIT was approved the setup of National Engineering Research Center for Train Intelligent, 2 Innovation Research Teams and 1 Key Laboratory of Zhejiang Province in 2011.

国家研究基地 National Research Bases

国家研究基地 National Research Bases

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

计算机辅助设计与图形学
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

国家列车智能化工程技术研究中心
National Engineering and Technology
Research Center for Train Intelligent

研究所
Institutes

院系 Department/College		
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
	智能系统与决策研究所 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
	计算机系统结构与网络安全研究所 Inst. of Computer System and Security	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. 新增国家重大科研项目

New National Important Projects

① 面向公共安全的跨媒体计算理论与方法

本“973”项目首席科学家为庄越挺教授，面向社会公共安全这一重大需求，对跨媒体数据所隐含热点话题进行分析，进而以跨媒体形式对其起源、现状及发展进行全过程呈现。共设置六个课题：（1）跨媒体数据统一表示和建模机制；（2）跨媒体属性感知模型与行为计算；（3）跨媒体语义学习与内容理解；（4）海量跨媒体数据挖掘与公共安全态势分析；（5）跨媒体搜索与内容整合；（6）面向公共安全的跨媒体呈现与验证和示范平台。



The Theory and Method of Cross-media for Public Security

The project directed by Prof. Zhuang Yueting was successfully granted by National “973” Program in 2011. It will study some methods to discover the hot topics in cross-media data and visualize their origins and trends. The theoretical and technological research in this project will be implemented in public security.

This project consist of six sub-task, namely, cross-media representation and modeling, cross-media perception and behavior computation, cross-media semantic learning and content understanding, large sale of cross-media mining and analysis, cross-media retrieval and content integration, cross-media visualization and application platform.

② 化工过程物质与能量高效利用的集成优化基础研究

本“973”项目将围绕化工过程物质与能量高效利用的目标，从复杂物质转化过程机理与系统行为特征关系、多过程能/质耦合的流程结构与系统效能关系、系统整体行为的智能调控和集成优化机制三个关键科学问题出发，研究化工过程中物质转化过程机理、系统行为特征、流程结构与参数，及其对生产过程物耗、能耗和废物排放的影响规律，提出化工过程物质与能量高效利用的集成优化理论方法和关键技术，并进行工业应用示范。

Fundamental research of chemical process integration and optimization for highly efficient utilization of materials and energy

Targeting on highly efficient utilization of materials and energy for chemical processes, as granted by National “973” Program in 2011, the project will conduct fundamental research on “mechanism and behavior analysis for complex material transformation”, “structure-efficiency analysis and optimization for multi-unit energy/mass coupling process”, “intelligent control and integrated optimization for system performance”. It is expected that fundamental principles, systematic characteristics are deeply investigated for chemical processes, and novel techniques are developed to reduce energy consumption, raw materials consumption, as well as waste discharge and emissions.



3 多层结构过程控制系统性能实时监控、评估与优化

由苏宏业教授领衔的国家自然科学基金重点项目，以大型流程生产过程为背景，通过研究面向多层结构过程控制系统性能实时监控、评估与优化理论与技术，为采用先进控制与优化技术实现生产过程的节能降耗目标提供支撑。

Real-time Monitoring, Assessment and Optimization of Multi-layer Process Control System

As the key project of NSFC, this project was directed by Prof. Su HongYe. Due to the facts such as complex process characteristics, large control system scale and lack of maintenance, the performance of control system tends to deteriorate, which restricts the continuous realization of energy and resource reduction of process industries. With large-scale process industries as background, the project will develop real-time monitoring, assessment and optimization theories and techniques for multi-layer process control system performance, which will support the realization of energy and resource reduction of process industries.



4 集成有源及微纳集总参数元件的Metamaterial研究

由冉立新教授领衔的国家自然科学基金重点项目，通过引入有源及微纳集总结构单元，实现结构单元具有微纳尺度、但工作于射频与微波波段的新型Metamaterial,使之具有损耗补偿、强非线性、非互易电旋、电调折射率等新的自然介质所不具有的特性，用于实现超分辨成像、电旋器件、新体制电扫描天线等新奇应用。



Research on Metamaterials Embedded with Active and Micro-nano Lumped Elements

This project directed by Prof. Ran Lixin, as the key project of NSFC, focus on the research of micro-nano metamaterials embedded with active and lumped elements. Such metamaterials are expected to work at RF and microwave frequencies and behave new characteristics that normal, naturally-occurring media do not have, such as loss compensation, strong nonlinearity, non-reciprocity, tunable refractive index, which can be used in sub-diffraction-limit imaging, gyro-electricity and new-scheme steering antenna applications.

5 非结构化数据库管理系统

由庄越挺教授负责的核高基重大专项项目，成功研制了面向开放互联环境的D-Ocean非结构化数据管理系统，已在数字图书馆、电子政务、新闻媒体、金融监控等领域进行示范应用。该系统具有自主知识产权，支持海量非结构化数据存储、计算、分析、查询、建模、开发的全过程管理。

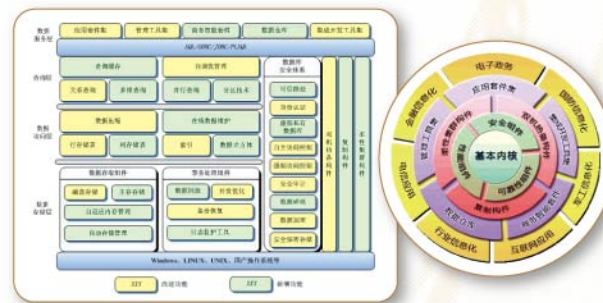
Unstructured Database Management System

This project directed by Prof. Zhuang Yueting, as a part of National Core-High-Base Major Project, has succeeded in the development of an unstructured database management system named "D-Ocean" under open internet environment, which has been applied in several industries, including digital library, e-government, news service, financial monitor etc. This system has independent intellectual property right, and supports the life-cycle management of large-scale unstructured data storage, computation, analysis, search, modeling and development.



6 大型通用数据库管理系统高可用性研发及示范应用

该项目由陈刚教授负责，作为2011年国家核高基重大专项的核心课题，研究目标是结合数据库产业界的发展趋势，针对国产数据库当前亟待提高的关键技术内容进行研发，设计实现高可用、高性能、高安全的国产神通数据库。同时本项目还将在产业界中建立应用集成和应用示范，引领国内数据库界的发展。



High Availability Development & Application of Mass Universal Database Management System

This project directed by Prof. Chen Gang, is a core sub-topics of National Core-High-Base Major Project in 2011. According to the development trend of database industry, the research objective of this project is to focus on some key techniques required to be improved greatly in the indigenous database management system, and is to enhance the performance, reliability and usability for the indigenous ShenTong database management system. Meanwhile, this project also will build some application integrations and application demonstrations in the industry, and take the lead of the indigenous database industry of China.

2. 科研成果奖

Research Achievements

1 跨行业的嵌入式系统软件平台SMART及其应用

该项目由计算机学院陈纯教授负责，获2011年国家科技进步二等奖。针对现有的嵌入式系统软件平台难以满足跨行业应用、开发效率较低等问题，项目组提出了子构件体系架构（SMART, Sub-coMponent ARchiTecture），研发了跨行业的嵌入式系统软件平台。项目组授权国家发明专利20多项，发表学术论文100多篇。项目成果成功应用于多个行业，经济、社会效益显著。



Cross-industry Embedded System Software Platform (SMART) and Its Applications

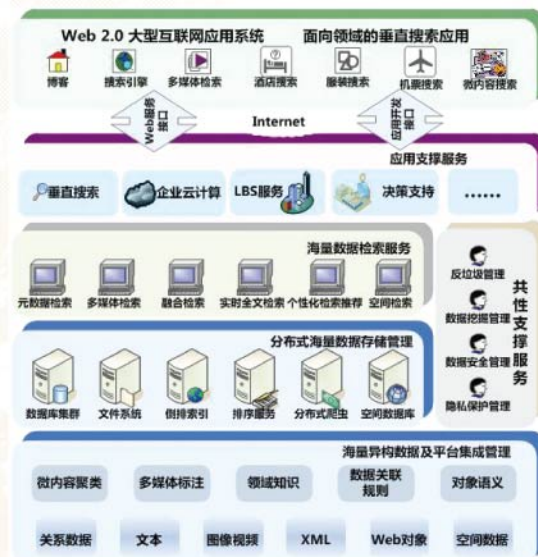
The project directed by Prof. Chen Chun from CS College was awarded the National 2nd Prize of Sci & Tech Progress in 2011. Embedded software is the soul of an embedded system. Existing embedded software platforms are insufficient in meeting the need of cross-industry applications. The project team proposed the Sub-component Architecture (SMART) and developed the cross-industry embedded software platform (SMART platform). The achievements include more than 20 invention patents and more than 100 publications, have been successfully applied in multiple industries with notable economic and social benefits.

2 互联网海量数据存储、管理与搜索平台研制及产业化应用

该项目由计算机学院陈刚教授负责，获2011年浙江省科学技术奖一等奖。在浙江省重大科技专项、国家自然科学基金以及若干企业合作重大专项计划的支持下，互联网海量数据存储、管理与搜索平台的整体技术达到国际先进水平，其中，在面向互联网应用的新型存储引擎、微内容实时搜索和针对异构数据的反垃圾技术等方面达到了国际领先水平。

Development and Application of Mass Web Data Storage, Management and Search Platform

The project directed by Prof. Chen Gang from CS College, supported by the major science and technology project from Zhejiang Province Science and Technology Agency, NSFC, as well as a number of enterprises specialized plans, was awarded 1st Prize of Sci. & Tech of Zhejiang Province in 2011. Its main technologies of the Internet, massive data storage, management and search platform reach over all the international advanced level. Several technology aspects including novel storage engine for Internet applications, micro content real time search, as well as heterogeneous data anti-spam technology reach the international advanced level.



3 面向创意产业的虚拟现实关键技术与支撑平台



该项目由计算机学院鲍虎军教授负责，获2011年高等学校科学技术奖一等奖。针对文博展示、数字媒体与娱乐、城市规划和产品设计等创意产业领域应用的共性需求，深入研究了虚拟现实的关键技术和内核软件架构，创新性地提出了高效的基于图像与视频的现实现场表达、自动构建与虚实融合等技术，构建了一个高性能虚拟现实支撑平台。本研究已获授权国家发明专利16项，发表国内外高水平学术论文70余篇。研发的支撑平台已在中国美院、中国湿地博物馆、中南卡通、网易、西门子等多家单位得到应用。

Innovation Industry Oriented Virtual Reality Key Technologies and Supporting Platform

The project directed by Prof. Bao Hujun from CS College was awarded the 1st Prize of University Sci & Tech Progress in 2011. Focused on the common demands of innovation industry, such as exhibition, digital media and amusement, urban planning, product design, the project studied the key technologies and supporting platform of virtual reality, and developed a high performance virtual reality supporting platform. It has got 16 patents and published about 70 papers. The virtual reality supporting platform was successfully applied to China Academy of Art, China Wetland Museum, ZhongNan Cartoon, Net Ease, Siemens, etc.

4 大型复杂纯碱装置优化运行技术与应用

该项目由控制系苏宏业教授负责，获2011年高等学校科学技术奖二等奖。实现了纯碱装置的多工序、多层次与多目标协调优化控制和生产运行的智能监控，填补了国内外纯碱行业先进控制和过程优化技术的空白；提高了装置产能和钠离子转化率、减少了物耗与综合能耗，近3年为企业累计创造了1.67亿元的经济效益。

Optimized Operation Technology and Application of Large-scale Complex Soda Ash Plant

The project directed by Prof. Su Hongye from Dept. of Control Science & Engineering was awarded the 2nd Prize of University Sci & Tech Progress in 2011. The project realized the intelligent monitoring of multi-process, multi-level and multi-object coordination optimization and production of soda ash plant, filled the technological gap of advanced control and process optimization of soda ash industry at home and abroad, increased the plant capacity and sodium ion conversion rate, reduced material consumption and energy consumption, and generated a total of 167 million of economic returns for enterprises in the past three years.

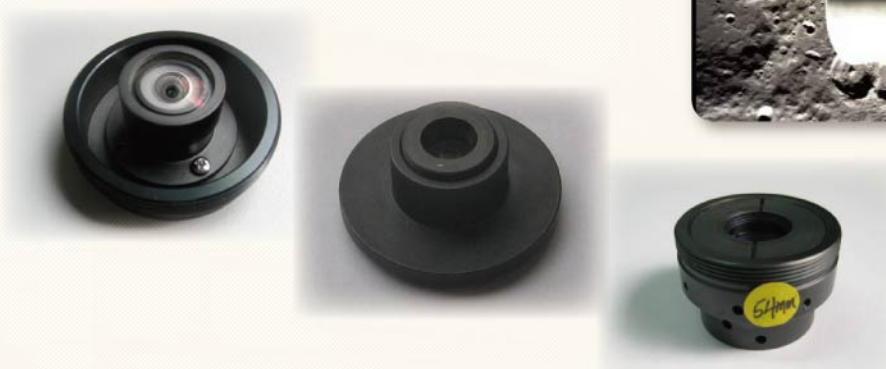


5 深空探测星载微小光学监视镜头

该项目由光电系徐之海教授负责，获2011年浙江省科学技术奖二等奖。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照相，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。

Microoptical Lenses on Space Exploration Satellite

The project directed by Prof. Xu Zhihai from Dept. of Optical Engineering was awarded the 2nd Prize of Sci & Tech of Zhejiang Province in 2011. The optical lenses 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 in the space between the Earth and the Moon to the public. The optical lenses and CMOS cameras made important contributions to the successful mission of CE-2.



3.年度TOP论文

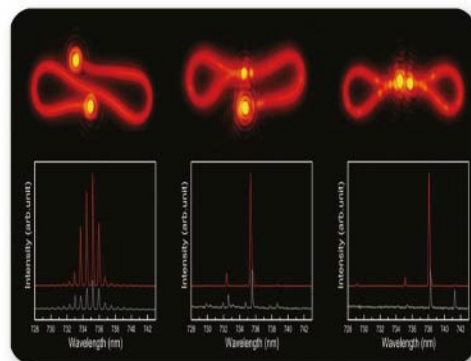
Recommended Papers

01.Single-Nanowire Single-Mode Laser

作者: Xiao, Yao; Meng, Chao; Wang, Pan; Ye, Yu; Yu, Huakang; Wang, Shanshan; Gu, Fuxing; Dai, Lun; Tong, Limin.
来源: NANO LETTERS 卷: 11 期: 3 页: 1122-1126 出版年: 2011

作为纳米级相干光源, 纳米线激光器具有很多应用前景。但是由于缺乏选模机制, 通常多模运行。该论文通过折叠CdSe纳米线形成高反射率环形镜及多腔耦合, 实现第一个低阈值单纳米线单模激光器, 使纳米线向实用化迈进一步。研究结果被《Nature》、《Nature Nanotechnology》、《Photonics Spectra》等专题报道和高度评价。

As nanoscale coherent sources, nanowire lasers are promising for many applications but traditionally they operate at multi-modes due to the lacking of mode selection capability. In 2011, by folding a 200-nm-diameter CdSe nanowire into high-reflectivity loop mirrors to create coupled cavities, The paper reported the first single-nanowire single-mode laser with low threshold, which paved the way to practical applications of nanowire lasers. This work was highlighted in Nature, Nature Nanotechnology, Photonic Spectra.



02.Quantum-Dot-Doped Polymer Nanofibers for Optical Sensing

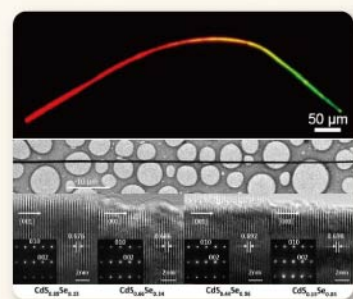
作者: Meng, Chao; Xiao, Yao; Wang, Pan; Zhang, Lei; Liu, Yanxin; Tong, Limin
来源: ADVANCED MATERIALS 卷: 23 期: 33 页: 3770 出版年: 2011

半导体量子点在发光器件、传感器和生物荧光标记等领域具有广泛应用前景。该论文工作成功研制了光学质量的CdSe/ZnS量子点掺杂的高分子纳米光纤, 使用导波激发, 基于单根量子点掺杂纳米光纤研制成功微尺寸、快响应、超低功耗的光学传感器。

Quantum dots(QDs) have found wide applications including light emitting devices, sensors and photoluminescent labeling. The paper reported optical-quality CdSe/ZnS-QD-doped polymer nanofibers which, when being waveguiding excited, were successfully used for optical sensing with small footprints, fast response and ultra-low operation power.

03.Spatial Bandgap Engineering along Single Alloy Nanowires

作者: Gu, Fuxing; Yang, Zongyin; Yu, Huakang; Xu, Jinyou; Wang, Pan; Tong, Limin; Pan, Anlian
来源: JOURNAL OF THE AMERICAN CHEMICAL SOCIETY 卷: 133 期: 7 页: 2037-2039 出版年: 2011



半导体纳米线的能带调控在其纳米光电子器件应用方面至关重要。本论文发明了一种移动源热蒸发生长方法, 首次在单根CdS_{1-x}Se_x纳米线上实现了能带从2.44 eV 到1.74 eV的连续大范围调控, 为基于单根半导体纳米线的宽带发光、光电探测等应用提供了新的途径。

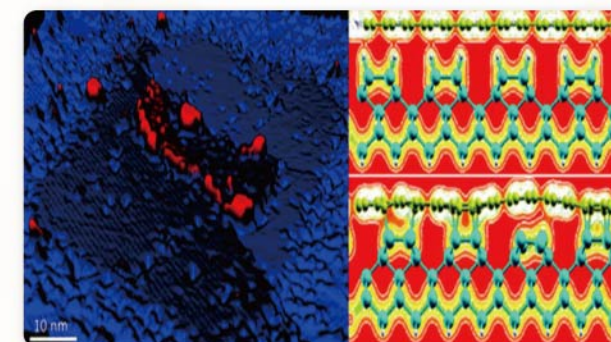
Bandgap engineering of semiconductor nanowires is important in designing nanoscale optoelectronic devices. The research invented a moving-source thermal evaporation technique, and realized spatial bandgap engineering in single CdS_{1-x}Se_x alloy nanowires with bandgap being modulated from 2.44 eV to 1.74 eV, promising new opportunities for nanowires in applications including broadband lighting and detection.

04.Inducing Electronic Changes in Graphene through Silicon (100) Substrate Modification

作者: Xu, Y.; He, K. T.; Schmucker, S. W.; Guo, Z.; Koepke, J. C.; Wood, J. D.; Lyding, J. W.; Aluru, N. R.
来源: NANO LETTERS 卷: 11 期: 7 页: 2735-2742 出版年: 2011

本文利用扫描隧道显微镜、扫描隧道光谱仪以及第一性原理计算的方法对单层石墨烯在硅衬底上的性质进行了详细的表征, 创造性地提出一种硅表面反复去氢钝化的方法。研究结果表明石墨烯在该方法中可保持其优良的本征电学特性; 而在未被氢钝化的硅衬底表面, 碳原子与硅原子之间共价键的存在, 极大地改变了石墨烯的电学性质。

The paper have performed scanning tunneling microscopy and spectroscopy (STM/STS) measurements as well as ab initio calculations for graphene monolayers on clean and hydrogen(H)-passivated silicon (100) (Si(100)/H) surfaces. The work represents the first demonstration of successful and reproducible depassivation of hydrogen from beneath monolayer graphene flakes on Si(100)/H by electron-stimulated desorption. The study demonstrated that graphene interacts differently with the clean and H-passivated Si(100) surfaces. The Si(100)/H surface does not perturb the electronic properties of graphene, whereas the interaction between the clean Si(100) surface and graphene changes the electronic states of graphene significantly.

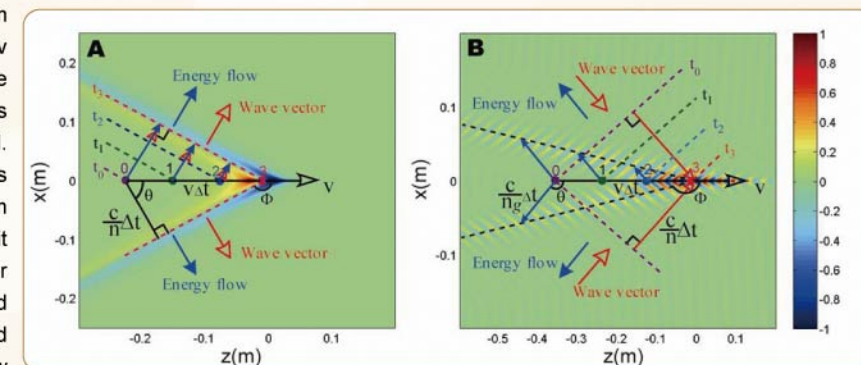


05.Flipping Photons Backward: Reversed Cherenkov Radiation

作者: Chen, Hongsheng; Chen, Min
来源: MATERIALS TODAY 卷: 14 期: 1-2 页: 34-41 出版年: 2011

在介质中, 带电粒子速度超过光速时, 能够产生Cherenkov辐射。在传统的正折射率材料中, 辐射方向是前向的, 而在折射率为负的异向介质中, 辐射方向是逆向的。由于辐射的能量和角度取决于带电粒子的速度, 所以Cherenkov辐射效应能够用于粒子的识别和计数。论文回顾了近年来对逆向Cherenkov辐射效应的研究, 包括第一次后向辐射的实现, 在反隐形器件上的潜在应用, 以及动量守恒方面的问题。

Charged particles moving faster than light in a medium produce Cherenkov radiation. In traditional, positive index-of-refraction materials this radiation travels forward. Metamaterials, with negative indices of refraction, flip the radiation backward. This readily separates it from the particles, providing higher flexibility in photon manipulation and is useful for particle identification and counting. Here the paper review recent advances in reversed Cherenkov radiation research, including the first demonstration of backward emission. And also discussed the potential for developing new types of devices, such as ones that pierce invisibility cloaks.

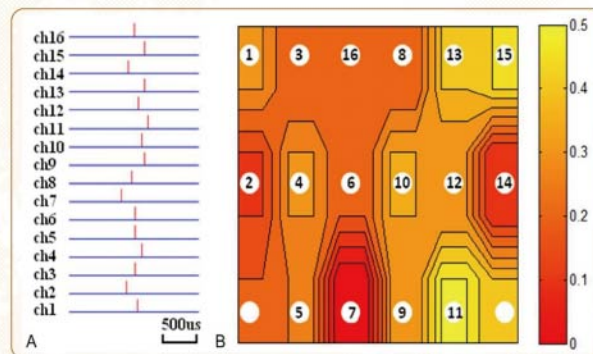


06.Extracellular Recording of Spatiotemporal Patterning in Response to Odors in the Olfactory Epithelium by Microelectrode Arrays

作者: Liu, Qingjun; Hu, Ning; Ye, Weiwei; Cai, Hua; Zhang, Fenni; Wang, Ping.
来源: BIOSENSORS & BIOELECTRONICS 卷: 27 期: 1 页: 12-17 出版年: 2011.

大鼠嗅黏膜上皮剥离后固定于微电极阵列表面, 感受细胞的胞外电生理信号多通道记录, 可用于分析组织中由不同气味引发的时间与空间响应特性, 为嗅觉传感机理的研究提供了新的平台。

Olfactory epithelium stripped from rat was fixed on the surface of microelectrode arrays (MEAs). Electrophysiological activities of olfactory receptor neurons were measured in the form of extracellular potentials. The spatiotemporal patterns on multi-channels correspond to different odors. It is an effective method for olfactory sensing mechanism research.

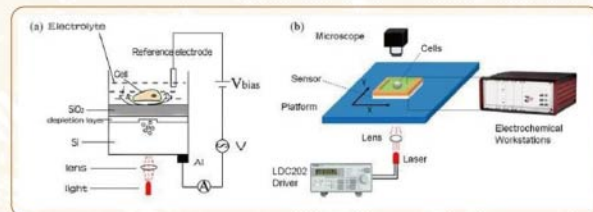


07.High Spatial Resolution Impedance Measurement of EIS Sensors for Light Addressable Cell Adhesion Monitoring

作者: Yu, Hui; Wang, Jun; Liu, Qingjun; Zhang, Wei; Cai, Hua; Wang, Ping.
来源: BIOSENSORS & BIOELECTRONICS 卷: 26 期: 6 页: 2822-2827 出版年: 2011.

该研究开发了一种高时间分辨率的基于阻抗测量的生物传感器用于检测细胞的贴壁活动。该传感器的一个显著特征是光寻址的功能, 克服了传统的传感器表面对检测对象几何上的限制, 极大方便了传感器表面细胞的培养和测量。

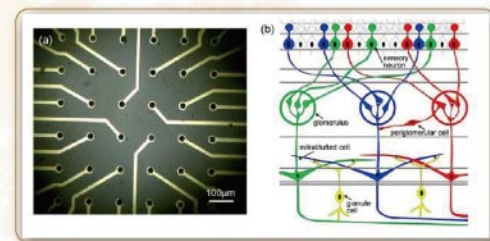
This study developed an impedance measurement-based biosensor with high spatial resolution for the monitoring of cell adhesion. The significant advantage of this biosensor is the light addressing ability which can overcome the geometrical restrict of cell culture on the surface of conventional biosensors and greatly facilitate the cell culture and measurements on sensor surface.



08.An olfactory Bulb Slice-based Biosensor for Multi-site Extracellular Recording of Neural Networks

作者: Chen, Qingmei; Xiao, Lidan; Liu, Qingjun; Ling, Shucan; Yin, Yifei; Dong, Qi; Wang, Ping.
来源: BIOSENSORS & BIOELECTRONICS 卷: 26 期: 7 页: 3313-3319 出版年: 2011

为了研究嗅球神经网络的电生理特性, 开发了一种新型的基于组织切片的生物传感器, 可以实现对组织切片的电生理信号进行多位点同步测量。该传感器成功记录了嗅球在受到不同的刺激条件下的放电模式的差异。



In order to investigate the electrophysiological properties of the olfactory bulb neural networks, The study developed a novel slice-based biosensor for synchronous measurement with multi-sites. This slice-based biosensor successfully recording the different firing patterns of olfactory bulb slice under different stimulations.

09.Ultra-sensitive Microfibre Absorption Detection in a Microfluidic Chip

作者: Zhang, Lei; Wang, Pan; Xiao, Yao; Yu, Huakang; Tong, Limin
来源: LAB ON A CHIP 卷: 11 期: 21页: 3720-3724 出版年: 2011

本论文首次报道了一种微纳光纤-微流控芯片超高灵敏度吸光度传感器。以亚甲基蓝为样品, 检出限达到50pM, 在0-5nM范围内具有良好的重现性。以牛血清白蛋白为样品检出限达到10fg/mL。此灵敏度较传统检测方法提高2000倍。

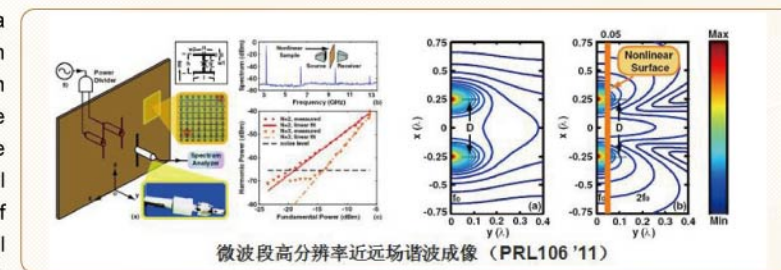
The paper reported an ultra-sensitive microfibre-microfluidic absorption sensor. Investigated by measuring the absorbance of methylene blue (MB), the sensor shows a detection limit down to 50 pM with excellent reversibility in a concentration range of 0-5 nM. The sensor has also been applied to bovine serum albumin (BSA) measurement, with a detection limit of 10 fg/mL. Compared with conventional UV-VIS spectrophotometer method with a 1 cm detection cell, the sensitivity of the MCBMS was enhanced at least 2000 times.

10.Harmonic Image Reconstruction Assisted by a Nonlinear Metmaterial Surface

作者: Wang, Zhiyu; Luo, Yu; Jiang, Tao; Wang, Zheng; Huangfu, Jiangtao; Ran, Lixin
来源: PHYSICAL REVIEW LETTERS 卷: 106 期: 4 出版年: 2011.

本文的实验演示了如何通过使用一个非线性人工表面得到微波频段的超分辨率近场图像重建。人工表面允许其高次谐波的空间波波前传至较基波较远的区域, 从而源的近场图像可以从其远场的辐射方向图中通过数学方法得以重构。

The paper experimentally demonstrated a microwave far-field image reconstruction modality with the transverse resolution exceeding the diffraction limit by using a single layer of highly nonlinear metamaterial. The harmonic fields of the nonlinear metamaterial surface allow the far-field propagation of wavefronts with spatial frequencies several times higher than that of the fundamental field. Near-field images can thus be mathematically recovered from the far-field patterns of the harmonic fields.



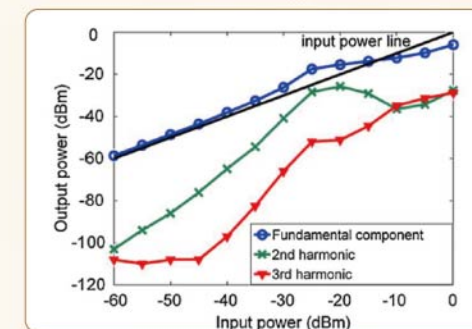
微波段高分辨率近场谐波成像 (PRL106 '11)

11.Active Microwave Negative-index Transmission Line with Gain

作者: Jiang, Tao; Chang, Kihun; Si, Li-Ming; Ran, Lixin; Xin, Hao
来源: PHYSICAL REVIEW LETTERS. 卷: 107 期: 20 出版年: 2011.

本文在微波频段研究了通过在人工复合传输线中嵌入隧道二极管得到的有源传输线。对于单、双、多节单元的测量表明, 上述直流泵浦的传输线在提供增益的同时, 可以保持原有的负折射率特性。该工作表明, 如果计及外界提供的能量, 具有增益的负折射率材料是可以存在的。

The paper studied active metamaterial transmission line at microwave frequency designed with incorporating a Germanium tunnel diodes. Measurements of the fabricated planar transmission line structures with one, two and three unit cells showed that the addition of the DC pumped tunnel diodes not only provided gain but also maintained the left-handedness. This work demonstrated that negative index material (NIM) can be obtained with net gain when external source is incorporated.



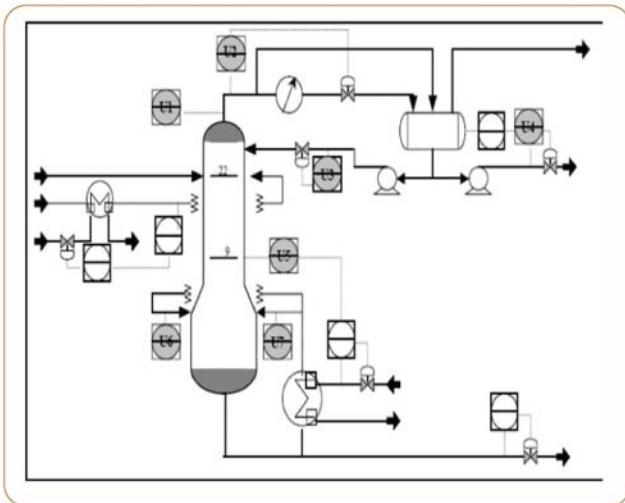
12.Semisupervised Bayesian Method for Soft Sensor Modeling with Unlabeled Data Samples

作者: Ge, Zhiqiang; Song, Zhihuan

来源: AICHE JOURNAL 卷: 57 期: 8 页: 2109-2119 出版年: 2011

在实际的软测量建模过程中, 我们通常只有一小部分数据具有完整的输入和输出数据信息, 而大部分数据则只有输入数据。基于该输入输出数据不平衡问题, 本论文提出了一种半监督形式的软测量建模方法。另外, 为了有效确定隐变量模型的维度, 在半监督模型中进一步引入了贝叶斯方法。在脱丁烷塔中的应用研究验证了方法的有效性。

In practical soft sensor modeling, may only obtain the output data for a small portion of the whole dataset, and have much more input data samples. In this paper, a semi-supervised method is proposed for soft sensor modeling, which can successfully incorporate the unlabeled data information. In order to determine the effective dimensionality of the latent space, the Bayesian regularization method is introduced into the semi-supervised model structure. The feasibility and efficiency of new developed soft sensor are evaluated through a debutanizer column case study.



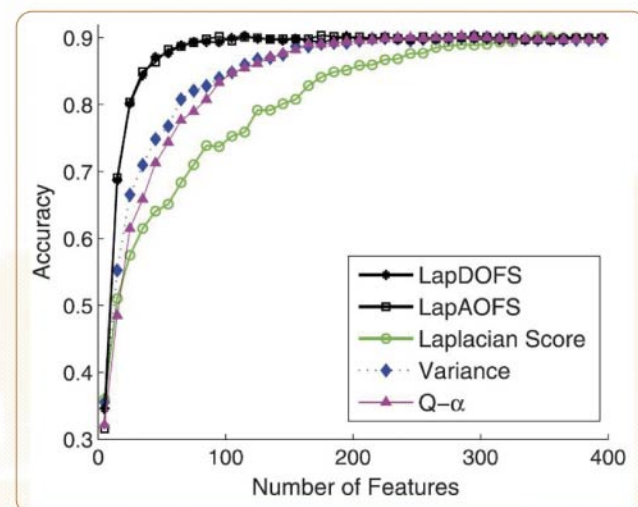
13.A Variance Minimization Criterion to Feature Selection Using Laplacian Regularization

作者: He, Xiaofei; Ji, Ming; Zhang, Chiyuan; Bao, Hujun

来源: IEEE TRANSACTIONS ON PATTERN ANALYSIS AND MACHINE INTELLIGENCE 卷: 33 期: 10 页: 2013-2025

出版年: 2011

本文考虑非监督的特征选择问题, 基于拉普拉斯正则化最小二乘法提出了两种全新的特征选择算法。新方法的策略是使得参数的协方差矩阵达到最小, 从而使得在未知样本上的期望误差最小。分别用迹和行列式两种算子来衡量协方差矩阵的大小, 并提出了高效的计算方法。实际数据上的大量实验表明了该算法的优越性。



In this paper, we consider the feature selection problem in unsupervised learning scenarios. Based on Laplacian regularized least squares, we propose two novel feature selection algorithms and select those features such that the size of the parameter covariance matrix of the regularized regression model is minimized. We use trace and determinant operators to measure the size of the covariance matrix. Efficient computational schemes are also introduced to solve the corresponding optimization problems. Extensive experimental results over various real-life data sets have demonstrated the superiority of the proposed algorithms.

14.A Shading Reuse Method for Efficient Micropolygon Ray Tracing

作者: Hou, Qiming; Zhou, Kun

来源: ACM TRANSACTIONS ON GRAPHICS 卷: 30 期: 6 出版年: 2011

本文提出了一种微多边形光线跟踪中的着色重用算法。该算法突破了以往算法的局限性, 去除了着色重用过程中对物体空间和图像空间之间映射关系的依赖, 从而得以将着色重用运用到折射、反射等光线跟踪效果中。和现有的微多边形光线跟踪算法相比, 本文算法可以减少一个数量级的着色计算, 并大大提高整体渲染效率, 便于在GPU上进行大规模并行实现。

This paper developed a shading reuse method for micropolygon ray tracing. Unlike previous shading reuse methods, this method doesn't Require an explicit object-to-image space mapping for shading density estimation or shading accuracy. It allowed the elegant handling of ray tracing effects such as reflection and refraction. The overhead of our shading reuse operations was minimized by a highly parallel implementation on the GPU. Compared to the state-of-the-art micropolygon ray tracing algorithm, The method is able to reduce the equired shading evaluations by an order of magnitude and achieve significant performance gains.



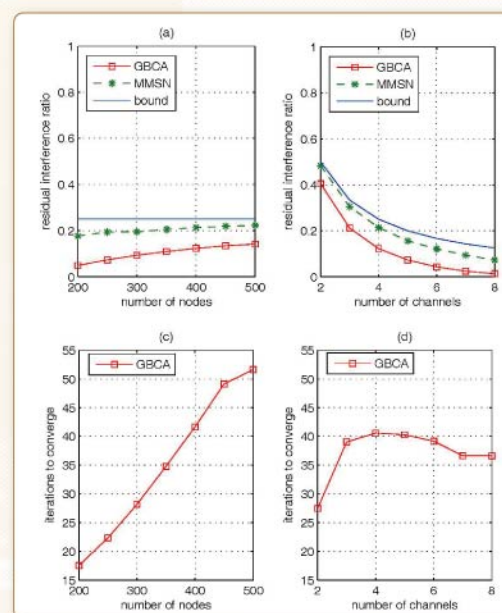
15.Game Theoretical Approach for Channel Allocation in Wireless Sensor and Actuator Networks

作者: Chen, Jiming; Yu, Qing; Cheng, Peng; Sun, Youxian; Fan, Yanfei; Shen, Xuemin

来源: IEEE TRANSACTIONS ON AUTOMATIC CONTROL 卷: 56 期: 10 页: 2332-2344 出版年: 2011

论文考虑传感器/执行器网络中的多信道分配的优化问题, 考虑网络拓扑和路由, 提出了一种基于博弈的静态信道分配算法。对树形和非树形路由场景, 证明了纳什平衡点的存在性, 并分析了纳什平衡的次优性和最佳回应策略的收敛性。

Multi-channel allocation in wireless sensor and actuator networks is formulated as an optimization problem, a distributed Game Based Channel Allocation Algorithm is proposed by taking into account both network topology and routing information. For both tree/forest and non-tree/forest routing, it is proved that there exists at least one Nash Equilibrium for the problem. Furthermore, the sub-optimality of NE and the convergence of the Best Response dynamics are also analyzed.



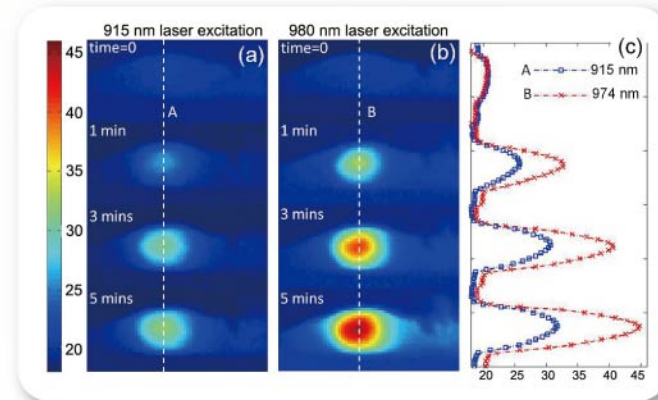
16. Using 915 nm Laser Excited Tm(3+)/Er(3+)/Ho(3+)-Doped NaYbF₄ Upconversion Nanoparticles for in Vitro and Deeper in Vivo Bioimaging without Overheating Irradiation

作者: Zhan, Qiuqiang; Qian, Jun; Liang, Huijuan; Somesfalean, Gabriel; Wang, Dan; He, Sailing; Zhang, Zhiguo; Andersson-Engels, Stefan

来源: ACS NANO 卷: 5 期: 5 页: 3744-3757 出版年: 2011

论文通过大量的理论模拟和实验论证,首次提出915nm的激光比传统的980nm激光更适合作为激励光用于上转换纳米发光颗粒的深层、低热损伤活体成像,

According to our computationally and experimentally investigation, a new promising excitation approach for upconversion photoluminescence imaging with less photothermal towards biological samples and larger imaging depth in tissue, is proposed employing a cost-effective 915 nm laser instead of traditional 980 nm laser.

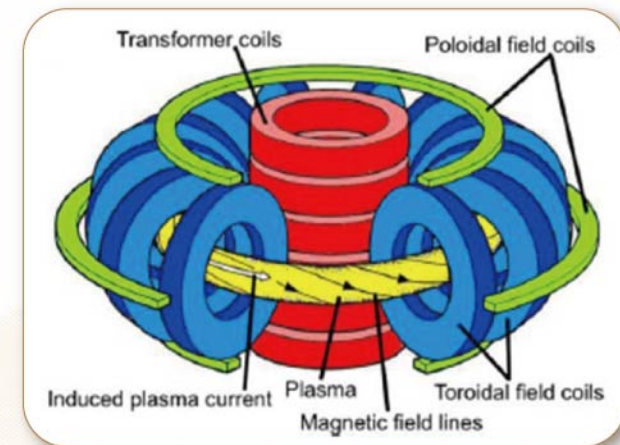


17. Sequential Linear Quadratic Control of Bilinear Parabolic PDEs Based on POD Model Reduction

作者: Xu Chao; Ou Yongsheng; Schuster Eugenio

来源: AUTOMATICA 卷: 47 期: 2 页: 418-426 出版年: 2011

磁约束热核聚变中的电流密度位形动力学可以描述为抛物型偏微分方程控制问题。利用正交分解方法生成典型子空间,将原系统利用嘎辽金方法投影到子空间获取低维双线性系统,其最优控制问题可以描述为非线性两端边界值问题。已有的求解该问题的数值方法很多,本文提出了序列二次最优控制综合,并讨论其收敛性。



The current density profile dynamics can be modeled by a parabolic partial differential equation (PDE) which could be controlled via the boundary and interior actuators. By using the proper orthogonal decomposition (POD) method and Galerkin method, we can obtain a low dimensional bilinear system capturing the dominant dynamics. The optimal control is governed by a two boundary value problem and we propose a novel numerical method, the sequential linear quadratic controller synthesis to obtain numerical solutions, and give a detailed theoretical convergence analysis.

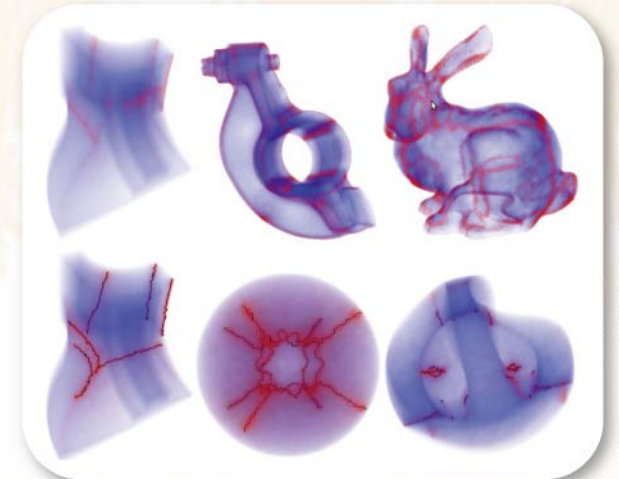
18. Boundary Aligned Smooth 3D Cross-Frame Field

作者: Huang, Jin; Tong, Yiyang; Wei, Hongyu; Bao, Hujun

来源: ACM TRANSACTIONS ON GRAPHICS 卷: 30 期: 6 出版年: 2011

本文提出了一种生成三维对称标架场的方法。和表面对称标架场不同的是,三维对称标架场的对称性无法用一个切平面的旋转角度表示。为此,本文利用球面函数来获得对称性表述,该表述对于绕任意轴旋转 $\pi/2$ 的整数倍以及不同轴之间的复合是不变的。基于此,可获得标架场光顺程度的一个有效度量,并将该标架场用于六面体网格生成。

In this paper, a method for constructing a 3D cross-frame field was presented. In contrast to the surface cross-frame field, symmetry for 3D cross-frame fields cannot be formulated by simple one-parameter 2D rotations in the tangent planes. Spherical harmonics was used to represent the 3D frames, in a manner invariant to combinations of rotations around any axis by multiples of $\pi/2$. With such a representation, an efficient smoothness measure of the cross-frame field was formulated and so the 3D cross-frame field can be applied to produce hexahedron-dominant meshes for given volumes.

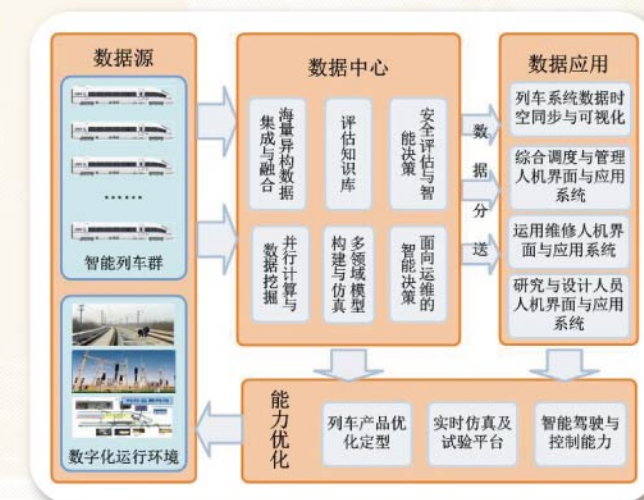


4. 新增科研基地

New Key Research Bases

■ 国家列车智能化工程技术研究中心

国家列车智能化工程技术研究中心由浙江大学与浙大网新集团有限公司于2011年9月联合组建,是浙江大学在四校合并后获批的第一个国家级工程技术研究中心。该中心由计算机学院陈纯教授领衔,重点在高速列车安全、运维和性能优化的智能化体系与共性技术等方面开展研究,以提升我国在轨道交通列车相关关键领域的智能化水平。



National Intelligent Engineering Research Center for Train Intelligent

The National Engineering Research Center for Train Intelligent is jointly sponsored by ZJU and Insigma Group Co., Ltd. in Sep. 2011, and it is the first national engineering research center established in ZJU after a combination of four major universities. The vision of this center is to improve the intelligence level in the key areas of rail transportation train, and it will mainly focus on several technology researches including intelligent systems and common technologies of high-speed train safety, operation & maintenance and performance optimization. Now the center is directed by Prof. Chen Chun.

■ 浙江省网络多媒体技术研究重点实验室

浙江省网络多媒体技术研究重点实验室由陈耀武教授领衔，依托数字技术及仪器研究所，主要研究方向：（1）视频编解码技术；（2）智能视频分析技术；（3）网络多媒体容错与客观质量评价。实验室致力于掌握领域的核心技术，为整个多媒体领域的发展铺平道路。

Zhejiang Provincial Key Laboratory for Network Multimedia Technologies

Zhejiang Provincial Key Laboratory for Network Multimedia Technologies based in the Institute of Advanced Digital Technologies & Instrumentation, is directed by Prof. Chen Yaowu. Its main research areas are: (1) Video encoding technology; (2) Intelligent video analysis technology; (3) Network multimedia error resilient and quality assessment. The laboratory is engaged in the research for common key technologies of network multimedia, which is the core technologies required in paving the way for the entire domain.



5.新增省科技创新团队

Sci & Tech Innovation Research Team of Zhejiang Province

团队名称 Innovation Research Teams	Leaders	Dept. & College
数字文化传媒技术 Digital Culture and Media Technology Innovation Research Team	鲁东明 Prof. Lu Dongming	计算机学院 College of Computer Science and Technology
光通信、光传感器件与技术 Advanced Devices and Technologies for Optical Communication and Optical Sensing Innovation Research Team	何赛灵 Prof. He Sailing	光电系 Dept. of Optical Engineering

Education
人才培养

学部共有10个本科专业，8个一级学科博士学位授予点，1个一级学科硕士学位授予点，22个二级学科博士学位授予点，23个二级学科硕士学位授予点。在校生（包括本科生和研究生）6340人，在国内外各类学科竞赛中取得了优异的成绩，本科生深造率达50%以上，2011年获全国优博论文1篇，优博提名论文2篇。

There are 10 undergraduate programs, 8 doctorate programs of first class, 1 master program of first class, 22 both doctorate and master programs of second class, and another one master program of second class. About 6340 full-time undergraduate and graduate students enroll at the the faculty. They have made outstanding achievements in various international or domestic disciplinary competitions. More than 50% undergraduate students can continue their studies at home and aboard. In 2011 year, one graduate thesis is awarded the National Excellent Doctoral Dissertation, and two graduate theses are awarded the Nominated National Excellent Doctoral Dissertation.

本科专业
UG Program

院 系 Department/College	
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 Technology
	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

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 Technologies and Instrument

电子科学与技术 Electronics 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 Systems
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 Systems 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 Applied Technology
计算机系统结构 Computer Systems Organization
数字化艺术与设计 Digital Art and Design
电子服务 Electronic Service

设计学* Design*

设计艺术学* Art of Design*

软件工程 Software Engineering

计算机软件与理论 Computer Software and Theory

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

在校生(人)
Enrollments

院系 Department/College	博士生 Doctor	硕士生 (全日制) Master	本科生 (08级、09级) Undergraduate
光电信息工程学系 Dept. of Optical Engineering	185	297	292
信息与电子工程学系 Dept. of Information Science and Electronic Engineering	217	451	659
控制科学与工程学系 Dept. of Control Science and Engineering	176	417	292
计算机科学与技术学院 College of Computer Science and Technology	452	898	930
生物医学工程与仪器科学学院 College of Biomedical Engineering & Instrument Science	150	260	315
软件学院 College of Software Technology		349	
合计 Total	1180	2672	2488

本年度招生数
Freshmen

院系 Department/College	博士生 Doctor	硕士生 (全日制) Master	本科生 (2010级) sophomore
光电信息工程学系 Dept. of Optical Engineering	41	105	125
信息与电子工程学系 Dept. of Information Science and Electronic Engineering	39	138	283
控制科学与工程学系 Dept. of Control Science and Engineering	38	125	131
计算机科学与技术学院 College of Computer Science and Technology	90	280	335
生物医学工程与仪器科学学院 College of Biomedical Engineering & Instrument Science	31	88	199
软件学院 College of Software Technology		199	
合计 Total	239	935	1073

毕业生(人)
Graduates

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	33	77	127
信息与电子工程学系 Dept. of Information Science and Electronic Engineering	34	147	297
控制科学与工程学系 Dept. of Control Science and Engineering	34	104	140
计算机科学与技术学院 College of Computer Science and Technology	64	287	466
生物医学工程与仪器科学学院 College of Biomedical Engineering & Instrument Science	27	66	156
软件学院 College of Software Technology		141	
合计 Total	192	822	1186

2011本科生深造与对外交流
Further Studies and International Exchange in 2011

院系 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	42	36.21%	42	36.21%	28
信息与电子工程学系 Dept. of Information Science and Electronic Engineering	52	19.92%	95	36.40%	38
控制科学与工程学系 Dept. of Control Science and Engineering	21	19.09%	41	37.27%	36
计算机科学与技术学院 College of Computer Science and Technology	101	23.01%	151	34.4%	132
软件学院 College of Software Technology					
生物医学工程与仪器科学学院 College of Biomedical Engineering & Instrument Science	21	13.46%	59	37.82%	33
合计 Total	237	21.90%	338	35.86%	267

2011新增国家规划教材
National Level Official Textbook in 2011

序号 No.	教材名称 Name	主 编 Chief Editor	出版社 Press
1	C语言程序设计辅导与实践 The C Programming Language Design Guidance and Practice	刘加海、陈忠宝、朱云芳等 编著 Liu Jiahai, Chen Zhongbao, Zhu Yunfang, etc	科学出版社 Science Press
2	工业自动化网络 Industrial Automation Networks	冯冬芹、王西、谢磊 Feng Dongqin, Wang You, Xie lei	中国电力出版社 China Electric Power Press
3	计算机控制系统 Computer Control System	王慧 Wang Hui	化工出版社 Chemical Industry Press

2011国际学科竞赛奖
International Disciplinary Competition in 2011

竞赛名称 Competition	奖 项 Award	获奖名单及作品 Awards List
第35届ACM/ICPC国际大学生程序设计竞赛世界总决赛 The 35 th ACM-ICPC World Finals 2011	冠军 Champion	ArcOfDream队：巫泽俊、欧阳嘉林等
2011年国际大学生程序设计竞赛 ACM International Collegiate Programming Contest Asia Region (ACM-ICPC)	亚洲赛区冠军 Champion, Asia Site	FutureGazer：庄俊元、范雨喆、姜凯
2011年美国IDEA设计大赛 2011 American IDEA Design Contest	IDEA设计大奖 IDEA Design Award	Panel Bin：邱懿武、陈清源、罗哲宁、邵诗怡、袁思思、酆轲、孙欣 Medical Shower：陈清源、酆轲、杨帆、邱懿武、邵诗怡、袁思思、罗哲宁、刘奕、孙欣
2011年德国红点概念设计大赛 2011 International Design Competition 'Red Dot Design Award'	红点设计大奖 (8项) Red Dot Design Award	作品Omni-Guard (中新合作)：谢达隆 (SUTD) 王琦、王亚男、郭晓林、黄洋 作品Happy-Scooter：王冠云、张宁、张钦皓 王亚男、黄洋 作品Seattoo：陶冶、魏明雅、石竹琳、赵艺钧、陈超 作品BEING：魏呈远、蔡建幸、帅颖斌、陈超 陶冶、王琦 作品Wheel+Chair：孙欣、彭俊杰、罗哲宁、顾时荣 邱懿武、吴添羽 作品Guesschess：酆轲、王念欧、邵诗怡、袁思思、邱懿武、陈清源 作品Eight Watch：陈清源、酆轲、潘予、曹瑜、顾时荣、刘奕、潘小碧、李晓玮 作品Snap Fastener Bags：魏可林、崔洪、宋艳宁、李恒、夏小敏
	红点至尊奖 (3项) Red Dot: best of the best	作品Netopee：魏呈远、吴疆、姚立夫、石磊、王冠云 作品Air-curtain Shower Cabin：刘奕 作品Topless Shoes：韩利科、刘鹏、庆宝、任明军、杨啸、林琳、陈轩
	IF概念设计奖 IF Concept Award	Which Is Mine：王念欧
2011年第十五届RoboCup 机器人世界杯比赛 The 15 th Robot World Cup (RoboCup 2011)	八强 The Top 8	Home组 (RoboCup家庭机器人组)：王军南、刘南洋、殷鹏辉、李千山、徐莹莹 小型组 (RoboCup类人组 (Kid-Size)) ZJUDancer：马月、殷鹏辉、占斐、毛翊超等 小仿人组 (RoboCup类人组 (Kid-Size)) ZJUNlct：李深、宋俊潇等
2011年国际大学生数学建模竞赛 2011 Interdisciplinary Contest In Modeling (ICM)	特等奖 Outstanding Winner	戴奇晏、李懿、丁寰宇
	一等奖 The 1 st Prize	杨家程、容榕、赵前程、侯擎昊、曹志兴、隋天举、姚开元、朱巍、瞿泽宁、王珂
	二等奖 The 2 nd Prize	罗丁、韦晓亚、张嘉斌

2011国内学科竞赛奖
Civil Disciplinary Competition in 2011

竞赛名称 Competition	奖 项 Award	获奖名单 Awards List
2011年中国机器人大赛暨 RoboCup公开赛 China Robot Competition and the RoboCup China Open 2011	冠军 Champion	RoboCup小型组：马月、殷鹏辉、占斐、毛翊超、 黄强盛、施则人、沈一凡等 RoboCup类人组(Kid-Size)：李深、俞凌等
	亚军 Runner-up	RoboCup家庭组：王军南、刘南洋、殷鹏辉、 李千山、徐莹莹、王越、孙小凯
	季军 Third Place	RoboCup救援仿真组：靳一凡、杨根茂、冯焕、 赖聪林等
2011年全国大学生数学建模竞赛 China Undergraduate Mathemati- cal Contest in Modeling 2011	一等奖 The 1 st Prize	吴超、潘钦旭、张博
	二等奖 The 2 nd Prize	宋博雅、马骁勇、傅诚、赵航琪、吴家楠、 俞超文、陈昊
2011年浙江省大学生数学建模竞赛 Zhejiang Provience Undergraduate Mathematical Contest in Modeling 2011	一等奖 The 1 st Prize	吴浩、黄敏之、李沐曦、朱玉可
	二等奖 The 2 nd Prize	毛宇尘、张芳源、于佳宁、安亚通、邓柏寒
	三等奖 The 3 rd Prize	吕家俊、应元翔、崔哲、李丹、夏修睿、张旭东
2011浙江省大学生多媒体设计竞赛 2011 Zhejiang Province Undergraduate Multimedia Design Competition	二等奖 The 2 nd Prize	陈烨、桂林、杨茜
浙江省第八届大学生程序设计竞赛 The 8th Zhejiang Province Undergraduate Programming Contest	一等奖 The 1 st Prize	We Love MM队：余洁莹、万纬等 萃梦想队：姜凯、陈章义、沈鑫 怪蜀黍队：宋之白、周逸伦等 [粗][斜]斯芬克斯之谜：梁嘉兴、朱玉可、万信逸
	二等奖 The 2 nd Prize	大写哦小写噢大写喔：徐仲文、何淇丹等
	三等奖 The 3 rd Prize	斯巴达：谢亚南、吴天宇、申皓全 英菲尼提斯托拉托斯：俞骁尧、赵灿辉、张言 美国•圣地亚哥：黄敏之、仝子飞、廖伟聪

2011专项奖
Special Awards in 2011

序号 No.	获奖学生 Winners	奖 项 Award	院 系 Department/College
1	王昀 Wang Yun	2010-2011学年浙江大学 竺可桢奖学金（研究生） Chu Kochen Scholarship	信息与电子工程学系 Dept. of Information Science and Electronic Engineering
2	贺诗波 He Shibo	2010-2011学年浙江大学 竺可桢奖学金（研究生） Chu Kochen Scholarship	控制科学与工程学系 Dept. of Control Science and Engineering
3	张利军 Zhang Lijun	2010-2011学年浙江大学 竺可桢奖学金（研究生） Chu Kochen Scholarship	计算机科学与技术学院 College of Computer Science and Technology
4	陈鑫磊 Chen Xinlei	2010-2011学年浙江大学 竺可桢奖学金（本科生） Chu Kochen Scholarship	计算机科学与技术学院 College of Computer Science and Technology
5	万纬 Wan Wei	2010-2011学年浙江大学 竺可桢奖学金（本科生） Chu Kochen Scholarship	控制科学与工程学系 Dept. of Control Science and Engineering

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	敏通奖学金 "Mintron" Scholarship	5
	舜宇奖学金 "Sunny" Scholarship	29
计算机科学与技术学院 College of Computer Science and 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	10
	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
	仟游奖学金 2K Scholarship	12
	软件、数字媒体基地奖学金 Software, Digital Media Base Scholarship	109
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	4
	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
	浙大信电—德州仪器大学生奖助学金 Dezhou Instrument Scholarship and Grant	18
	浙大信电—大华奖助学金 DaHua Scholarship and Grant	8
生物医学工程与仪器科学学院 College of Biomedical Engineering & Instrument Science	浙大信电—高逸奖助学金 GaoYi Scholarship and Grant	10
	浙大生仪-德州仪器大学生奖助学金 Texas College Scholarship	12
	春晖奖学金 "Chunhui" Scholarship	3
	E+H奖学金 E+H Scholarship	10
控制科学与工程学系 Dept. of Control Science and Engineering	中控奖学金 "Zhongkong" Scholarship	26

全国优博论文奖 National Excellent Doctoral Dissertation

论文题目：视频场景的重建与增强处理
作者：章国锋
指导教师：鲍虎军
一级学科：计算机科学与技术

Title: Video Scene Reconstruction and Enhancement
Author: Zhang Guofeng
Supervisor: Bao Hujun
Discipline: Computer Science and Technology

论文深入研究了计算机视觉中视频场景的三维几何重建与运动恢复问题，充分利用视频序列中信息的连贯性和冗余性，借助视频场景的关键帧表达和多帧信息统计互补的创新思路，提出了一个高效鲁棒的全局优化计算框架，有效解决了摄像机参数、深度和光流等信息的高精度恢复以及视频场景的层次分割等难题，为大规模城市三维建模、自主视觉导航、视频场景的理解与重用以及虚实交互融合等重要应用奠定了基础。

This thesis mainly focused on solving the 3D geometry reconstruction and motion recovery problem from the real captured video data. By making use of information consistency and redundancy of video data, and leveraging the creative ideas of keyframe representation and the complementary information from multiple frames, we proposed a robust and efficient global optimization framework to deal with camera tracking, dense depth recovery, motion estimation, and video segmentation. It profited many applications, such as large-scale city modeling, autonomous visual navigation, video scene understanding and reusing, and mixed reality, all of which are regarded fundamentally important but difficult in the technical level traditionally.



全国优博论文提名奖 Nominated National Excellent Doctoral Dissertation

论文题目：复杂工况过程统计监测方法研究
作者：葛志强
指导教师：宋执环
一级学科：控制理论与控制工程

Title: Statistical Process Monitoring Methods for Complex Processes
Author: Ge Zhiqiang
Supervisor: Song Zhihuan
Discipline: Control Theory and Control Engineering

针对工业过程中的复杂数据分布、非线性、多工况以及动态性等各种复杂特性，论文提出了多种有效的过程监测方法，取得了多项创新性成果，如基于独立成分分析和主元分析(ICA-PCA)两步信息提取策略的过程监测方法、基于贝叶斯推理的非线性和多工况过程监测方法、以及基于统计局部建模的动态过程监测方法等。相比传统的过程监测方法，论文取得的研究成果对提高复杂过程的监测性能具有更好的理论意义和应用价值。



For monitoring of different complex processes, such as complicated data distribution, nonlinear and multimode processes, and dynamic processes, the corresponding novelty methods were proposed in this thesis, such as the ICA-PCA two step information extraction strategy based monitoring approach, Bayesian modeling methods for nonlinear and multimode process monitoring, local-approach based dynamic monitoring method, etc. Compared to traditional process monitoring methods, more significant performance of the industrial process can be obtained by the new methods in both theory and application aspects.

全国优博论文提名奖 Nominated National Excellent Doctoral Dissertation

论文题目：先进光纤激光器技术及其在光传感、光学微波产生的应用
作者：陈达如
指导教师：何赛灵
一级学科：光学工程

Title: Advanced Fiber Laser Technology and Its Applications in Optical Sensing & Optical Microwave Generation
Author: Chen Daru
Supervisor: He Sailing
Discipline: Optical Engineering

本文研究了基于拉曼/掺铒光纤混合增益和基于包括光子晶体光纤在内的高非线性光纤四波混频效应的多波长掺铒光纤激光器技术；提出了几种高双折射光子晶体光纤，并给出了光子晶体光纤在多波长拉曼光纤激光器、波长切换光纤激光器等方面的应用例子；搭建了连续波傅立叶域锁模光纤激光器并首次将其应用于光纤布拉格光栅解调，首次提出了频谱受限傅立叶域锁模光纤激光器并探讨了该技术在光纤布拉格光栅多点传感方面的应用；刻写了光纤布拉格光栅对，利用该器件分别实现了单波长、双波长单频光纤激光器，并基于双波长单频激光器实现了光学微波产生；基于双折射高浓度掺铒光纤实现了双波长单频激光输出，并利用该双波长单频激光产生了高频微波信号。

Multi-wavelength Erbium-doped fiber laser technologies based on hybrid gain of Raman and Erbium-doped fiber or four-wave-mixing (FWM) effect based on highly nonlinear fibers including the photonic crystal fiber (PCF) have been investigated. We proposed several highly birefringent PCFs, and multi-wavelength Raman fiber lasers and wavelength switchable fiber lasers based on PCFs were experimentally demonstrated. We built up a continuous-wave Fourier domain mode locking (FDML) fiber laser and demonstrated its application for fiber Bragg grating (FBG) interrogation. For the first time, a spectrum-limited FDML fiber laser was proposed and utilized in FBG multi-point sensing system. A fiber Bragg grating pair (FBGP) with the function of narrow-band filtering was achieved by using our FBG fabrication system and used to achieve single-wavelength and dual-wavelength single frequency fiber laser was used for optical microwave generation. A frequency fiber lasers. The FBGP dual-wavelength single frequency fiber laser was achieved based on a birefringent fiber with high Erbium concentration, and high frequency microwave signal was produced base on such a dual-wavelength single frequency fiber laser.





International Exchange and Cooperation

海外交流

海外交流概况 International Exchange and Cooperation

2011年出访参加学术会议、合作交流的教师325人次，接待180多人次国外学者来访进行学术交流，举办国际会议13次。学部主任刘旭教授率团访问美国常春藤大学Brown，就本科生交流、青年教师互访、科学研究合作等事项达成了初步意向，学部副主任荣冈教授率团参加早稻田大学IPS学院举办的2011国际合作专题研讨会。学部各院系与国外著名大学继续加强学生联合培养，推进教师科研合作，进一步提升了各学科的科研和教学水平。

About 325 teachers visited abroad for academic conference and the cooperation research. More than 180 world-renowned scholars have been invited to visit FIT for lectures and academic communication. About 13 international conferences were held successfully. The delegation of FIT, led by Professor Liu Xu, Dean of FIT, visited the Brown University and got the preliminary intent on issues such as the undergraduate student exchange, young teachers' visits and scientific research cooperation. Professor Rong Gang attended the International Collaboration Symposium 2011 held by IPS of Waseda University. The departments and colleges of FIT strengthened the student exchanges and teacher cooperation research continuously, It further promoted the level of teaching and science research.



主办国际会议 Host International Conferences

序号 No.	会议名称 Conference	时间 Date
1	2011年电磁学研究进展国际研讨会 Progress in Electromagnetics Research Symposium	Sep.12-15, 2011
2	第11届IEEE通信与信息技术国际大会 The 11 th IEEE International Symposium on Communications and Information Technologies	Oct.12-14, 2011
3	2011年多媒体信息处理国际会议 IEEE International Workshop on Multimedia Signal Processing	Oct.17-19, 2011
4	2011年先进封装及系统电子设计国际学术会议 2011 IEEE Electrical Design of Advanced Packaging and Systems Symposium	Dec.12-14, 2011
5	2011年工业过程先进控制国际研讨会 International Symposium on Advanced Control of Industrial Processes (AdConIP2011)	May 23-27, 2011
6	2011年IEEE仪器仪表与测量大会 2011 IEEE International Instrumentation and Measurement Technology Conference	May 9-12, 2011
7	2011跨媒体计算与统计学习国际学术研讨 2011 International Symposium on Cross-media Computing and Statistical Learning	Aug.4-5, 2011
8	2011智能人机系统与控制论国际学术会议 2011 International Conference on Intelligent Human-Machine Systems and Cybernetics	Aug.25-26, 2011
9	调度学研究展望国际研讨会 The Workshop on New Perspectives in Scheduling Theory	Oct.9-13, 2011
10	2011知识建模与决策中的集成不确定性国际学术研讨会 暨2011计算智能与设计国际研讨会 International Symposium on Integrated Uncertainty in Knowledge Modelling and Decision Making & Computational Intelligence and Design	Oct.28-30, 2011
11	第七届中国蛋白质组学大会暨第三届国际蛋白质组学论坛 The 7th CNHUPO ANNUAL Cogress & 3rd International Forum of Proteomics	Apr.15-18, 2011
12	2011心脏学计算国际学术会议 Computing in Cardiology 2011	Sep.18-21, 2011
13	长江2011国际医学影像物理和工程应用大会 暨第六届中国医学影像物理学术年会 Yangtze River 2011 International Conference on the Application of Medical Imagine Physics & The 6th National Annual Meeting of Medical Imaging Physics	Oct.22-23, 2011

第11届IEEE通信与信息技术国际大会
The 11th IEEE International Symposium
on Communications and Information Technologies



2011年先进封装及系统电子设计国际学术会议
2011 IEEE Electrical Design of Advanced
Packaging and Systems Symposium

2011年工业过程先进控制国际研讨会
International Symposium on
Advanced Control of Industrial Processes



长江2011国际医学影像物理和工程应用大会暨第六届中国医学影像物理学术年会
Yangtze River 2011 International Conference on the Application of Medical
Imaging Physics & The 6th National
Annual Meeting of Medical Imaging
Physics



第七届中国蛋白质组学大暨第三
届国际蛋白质组学论坛
The 7th CNHUPO ANNUAL
Congress & 3rd International
Forum of Proteomics

2011跨媒体计算与统计学习
国际学术研讨会
2011 International Symposium on Cross-media
Computing and Statistical
Learning



2011 News 2011 要闻

学部召开专门委员会全体会议，杨卫校长出席并寄语信息学部
The special committee meeting of FIT were held. Yang Wei, President of ZJU, was present at the meeting and gave messages to FIT



部专家委员会全体会议



杨卫校长寄语信息学部

信息学部——加强协作，积聚人才，构筑能力，
梳理方向，引领发展；

光电系——保持优势，加强协作，扩大亮点；

信电系——构筑平台，形成优势，整体提升；

控制系——理论创新，平台筑就，行业引领；

计算机学院——广引结构，引领应用，加强设计；

软件学院——抓住机遇，营造文化，形成标志。

金德水书记来信息学部调研

Jin Deshui, Chancellor of ZJU, investigated the teaching and research of FIT.

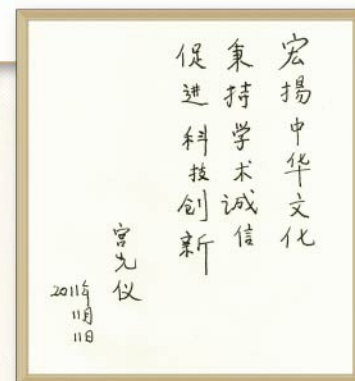


院士寄语

Academician messages

为信息化与工业化深度融合而努力！

孙家骅 2011.11.3



培養創新性人才
引領信息化潮流
潘雲鶴

计算机学院吴朝晖教授
获2011何梁何利“科学
与技术创新奖”。

Prof. Wu Zhaohui from CS
College received the Sci &
Tech Innovation Award of
Ho Leung Ho Lee
Foundation in 2011.



陈积明教授获2011年度
IEEE通信学会亚太区杰
出青年学者奖

Prof Chen Jiming received
Outstanding Young
Researcher Award of 2011
IEEE Communication
Society Asia-Pacific Board



计算机学院周昆教授被麻省理工学院《技术评
论》评为“2011年度全球杰出青年创新人物”

Prof. Zhou Kun from CS College was named one of
the world's top 35 young innovators by MIT
Technology Review for a programming language
called RenderAnts in 2011.



11月，以Sune Svanberg为主席的评估委员会对光学工程学科进行了国际评估。

In November 2011, an International Evaluation Committee, led by Prof. Sune Svanberg, performed an evaluation on the Optical Engineering Discipline at ZJU.



控制系智能系统与控制研究所的机器人实验室研制出仿人机器人——“悟”、“空”。

The robotics laboratory of the Institute of Cyber Systems and Control has successfully developed two humanoid robots, named "Wu" and "Kong".

依托信息学部先进传感器研究平台，物联网国际学术研讨会于5月9日-20日顺利举行。

Rely on Advanced Sensor Research Platform of FIT, International Workshop and Summer School on the Internet of Things (IOTs2011) was held successfully On May 5-20.



10月22日，信息学部青年教师学术论坛“走进‘感知中国’中心”在无锡物联网产业研究院举行。

On October 22, the activity of "Access the 'Sensing China' Center", hosted by the Young Teacher Forum of FIT, was held at the Wuxi Sensing Network Industry Research Institute.

“五四”青年节，信息学部第一届青年教师奖颁奖，11位40岁以下的青年教师获奖

On Youth Day, FIT held the first award ceremony for the young teachers. There are totally 11 outstanding young teachers under 40 years old awarded the prize.

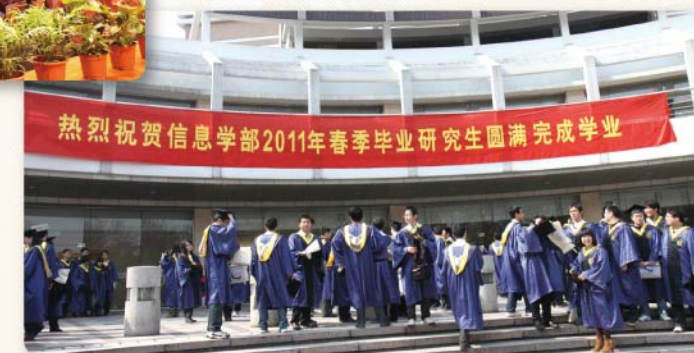


浙大为荣 明天浙大以我为荣



3月25日，信息学部举行2011届研究生春季毕业典礼暨学位授予仪式


2011 FIT graduation and degree ceremony for spring graduate students was held on March 25.



由信息学部主办的江苏省部分重点中学校长会于4月22日~23日在杭州举行

On April 22-23, chiefs of partial key high school in Jiangsu province attended the symposium on communication and cooperation hosted by FIT.



 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，信息学部办公室主任主编的《Annual Report 2011》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？灿烂的心情怎一个“乐”字可概括？

面对着这本小册子——《Annual Report 2011》，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；盼望着，我们盼望着信息学科一步步的前进，自立在民族之林，跻身于世界一流……

编者

2012年4月于老和山下