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Annual Report 2013



INTRODUCTION TO FIT 学部概况

信息学部涵盖了光电信息工程学系、信息与电子工程学系、控制科学与工程学系、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2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，1个国家工程实验室，3个国家工程研究中心，共有20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。

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 & Instrumental 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, 1 National Engineering Laboratory, 3 National Engineering Research Centers, 20 research institutes, to devote in the research of science issues and innovation of technical problem in the area of information technology.



主任：刘旭
Dean: Liu Xu



副主任：荣冈
Vice-Dean: Rong Gang



副主任：鲍虎军
Vice-Dean: Bao Hujun

Annual Report 2013

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生物医学工程与仪器科学学院



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

Academic Committee

Director: Sun Youxian Vice-Director: Liu Xu
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 Zhaoxue
Zhou Kun Duan Huilong Chen Yaowu

学位委员会

主任: 鲍虎军 副主任: 杜一平
委员: 白剑 仇昱 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 Huilong
Committee members:
Liu Cheng Tong Limin Liu Xiangdong
Yan Xiaolang Zhang Xianmin Zhang Zhaoyang
Sun Youxian Zhang Hongjian Su Hongye
Zhuang Yueting Chen Chun Bao Hujun
Wu Zhaoxue 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

TALENT TEAM

师资队伍

教職員工665人, 其中正高163人, 副高279人。有中國工程院院士3人, 教育部長江特聘教授9人, 浙江省千人計劃教授9人, 973首席科學家4人, 973青年科學家1人, 國家自然科學基金傑出青年獲得者11人, 優秀青年基金獲得者3人。國家自然科學基金創新群體2個, 教育部創新團隊2個。

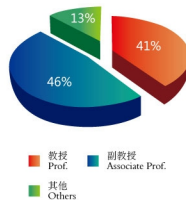
2013年新聘 3人, 優秀青年基金獲得者1人, 教育部新世紀人才2人, 浙江省“千人計劃”教授2人, 江學者特聘 3人, 寶鋼優秀教師獎獲得者1人。

FIT has about 665 faculty members, including 163 full professors, 279 associate professors. There are 3 members of the Chinese Academy of Engineering.

9 Special-term professors (7 chair professors besides) specially engaged in the National Cheung Kong Scholar Program, 9 Zhejiang Provincial Program of High-Level Overseas Talents, 4 Chief Scientists of National "973" Program, 1 Young Scientist of National "973" Program, 11 National Distinguished Youth Science Foundation Fellows, 3 National Excellence Youth Science Foundation Fellows. 2 Innovative Research Groups of the NSFC and 2 Innovative Research Teams of Ministry of Education have been constructed. In 2013,

2 professors were appointed as National High-Level Talents Special Support Plan Fellows, 3 Professors were engaged in the National Cheung Kong Scholar Program, 1 professor was appointed as National Excellent Youth Science Foundation Fellow, 2 faculty members were engaged in MOE Trans-century Excellent Scholar Training Program, 2 professors were appointed as Zhejiang Province High-level Overseas Talents, 2 Professors were appointed as Zhejiang Province Young Experts with Outstanding Achievement, 1 professor was bestowed the Bao Gang Excellent Teacher Prize.

师资队伍职称结构
Professional Structure



2013年新聘 Awarded in 2013

... 专家教授



俞斌
Yu Bin



潘杰
Pan Jie

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

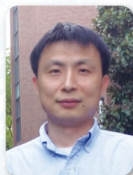
生物医学工程与仪器科学学院
College of Biomedical Engineering & Instrument Science

软件学院
College of Software Technology

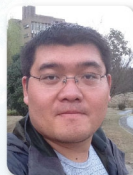
青年专家



斯 科
Si Ke



刘 畅
Liu Yang



李 玺
Li Xi

“万人计划”科技创新领军人才
National High-Level Talents Special Support Plan Fellows



鲍虎军
Bao Hujun



吴朝晖
Wu Zhaohui

长江学者特聘教授
“Cheung Kong Scholar's Program” Professors



苏宏业
Su Hongye



童利民
Tong Limin

专家教授

优秀青年基金获得者
National Excellence Youth Science Foundation Fellow



黄铭钧
Huang Mingjun



陈红胜
Chen Hongsheng

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



陈 曦
Chen Xi

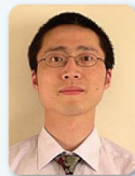


潘 纲
Pan Gang

浙江省 专家 教授



陈延伟
Chen Yanwei



项 阳
Xiang Yang

浙江省有突出贡献中青年专家
Zhejiang Province Young Experts with Outstanding Achievement



庄越挺
Zhuang Yueting



刘承
Liu Cheng

浙江省优秀科技工作者
Zhejiang Province Excellent Sci-Tech Workers



杨春节
Yang Chunjie

宝钢优秀教师
Bao Gang Excellent Teacher



陈文智
Chen Wenzhi

教授
Professors



杨青
Yang Qing



李建龙
Li Jianlong



董树荣
Dong Shurong

教授
Professors



王保良
Wang Baoliang



罗仕鉴
Luo Shijian



寿黎旦
Shou Lidian



吴健
Wu Jian



陈祥献
Chen Xiangxian



刘清君
Liu Qingjun

副教授
Associate Professors



刘东
Liu Dong



张秀达
Zhang Xiuda



吴波
Wu Bo

副教授
Associate Professors



李强
Li Qiang



刘英
Liu Ying



余辉
Yu Hui



蔡云龙
Cai Yunlong



李宇波
Li Yubo



胡浩基
Hu Haoji



王酉
Wang You



许超
Xu Chao



李明
Li Ming

副教授
Associate Professors



陶煜波
Tao Yubo



翁彦琳
Weng Yanlin



孙莲莉
Sun Lianli



黄正行
Huang Zhengxing



张明伟
Zhang Mingwei

引进教师
New Teachers

斯科
Si Ke

张睿
Zhang Rui

叶志
Ye Zhi

余辉
Yu Hui

刘阳
Liu Yang

鲁伟明
Lu Weiming

张克俊
Zhang Kejun

陈翔
Chen Xiang

邱显
Qiu Xian

卜凯
Bo Kai

历向东
Li Xiangdong

黄正行
Huang Zhengxing

潘杰
Pan Jie

周剑
Zhou Jian

SCIENTIFIC RESEARCH

科学研究

2013年到校科研经费逾4.6亿元，纵向经费占76%以上，其中国家自然科学基金获资助65项，合计经费4713万元。在研千万级项目26项，新增千万级项目6项，新增自然科学基金委重点项目1项，优秀青年科学基金1项。据不完全统计，2013年SCI收录论文610篇，其中影响因子5.0以上的论文有10篇；获国家授权发明专利319项；获国家科技进步奖一等奖1项，国家自然科学基金二等奖1项，省部级科学技术一等奖2项。工业控制系统安全技术国家工程实验室2013年获批。

The total research funding of FIT in 2013 reached over 460 million RMB, about 76% of which from the state government. FIT got 65 projects from NSF China with 47.13 million RMB in total. About 610 published papers are indexed by SCI together with 319 patents of invention registered. FIT got 1 First Award for National Sci & Tech Progress, 1 Second Award for National Nature & Science Progress and 2 First Awards for Provincial Sci & Tech Progress. It has 26 Grant National Projects in progress, with over ten million RMB each, 1 China national funds for Distinguished Young Scientists and 1 key project of NSFC. Besides, construction of National Engineering Laboratory for Industrial Control System Security & Safety were approved in 2013.

国家研究基地

National Research Bases

国家研究基地
National Research Bases



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
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 Cyber-Systems and Control	褚健 Prof. Chu Jian
	人工智能研究所 Inst. of Artificial Intelligence	庄越挺 Prof. Zhuang Yueting
计算机科学与技术学院 College of Computer Science and Technology	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
	生物医学工程研究所 Inst. of Biomedical Engineering	段会龙 Prof. Duan Huilong
生物医学工程与仪器科学学院 College of Biomedical Engineering & Instrument	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

项目名称 Project	负责人 Director	来源 Source
中国工程科技知识中心关键技术研究 Research on Key Technologies of Chinese Knowledge Center for Engineering, Science and Technology	庄越挺 Prof. Zhuang Yueting	中国工程院 CAE, Chinese Academy of Engineering
16×16高速光交换集成芯片与模块 16x16 Integrated High-Speed Optical Switching Chip and Module	何建军 Prof. He Jianjun	863计划 National High-Tech R&D Program of China (863 Program)
我国近岸重要生物毒素监测技术产品化及业务化应用示范 Bio-toxin monitoring technology and application in China's coastal	王平 Prof. Wang Ping	国家海洋局公益行业科研专项 Scientific Research Project of Ocean Public Welfare Industry of State Oceanic Administration, China
基于动态优化方法的过程和运行控制一体化设计理论及应用研究 Research of Theory and Application on Integration of Process Design and Running Control Based on Dynamic Optimization	苏宏业 Prof. Su Hongye	国家基金委国际合作项目 Major International Cooperation Project of NSFC

2. 重大科研成果及进展

Research Achievements and Significant Progress

① 高端控制装备及系统的设计开发平台研究与应用

该项目由控制系孙优贤院士负责，获2013年国家科技进步一等奖。高端控制装备及系统是国家重大装备与重大工程的神经中枢、运行中心和安全屏障。本项目经过十年的努力，解决了高端控制装备及系统的高安全性、高可靠性、高适应性、大规模化等四大难题，打破了国外的垄断，形成了具有自主知识产权的完整技术体系，为高端控制装备及系统的自主设计开发提供硬件平台、软件平台、先进控制与优化平台，起到了不可替代的作用。成果成功应用于特大型高炉TRT装置等各行业工业装置2500余套，同时产品已出口多个发达国家，形成国际市场竞争优势；近三年创造经济效益72.9亿元，显著促进了节能、降耗、减排。

Research and Application of Design and Development Platform for Advanced Control Equipments and Systems

The project directed by Academician Sun Youxian from Dept. of Control Science and Engineering was awarded the National 1st Prize of Sci & Tech Progress in 2013. The national control equipments and control systems are the nerve centers, operations centers, and security barriers of the modern industrial processes. Facing the national needs, after a decade of technology development and applied research, the group has solved the four key problems of high security, high reliability, high adaptability, and large scale, and made significant innovations to establish successfully the design and development platform for developing advanced control equipments and systems. The advanced control equipment and system design and development platform, which is with independent intellectual property, is composed of the hardware platform, the software platform, and the advanced control and optimization platform. It has played an irreplaceable role in the development of advanced control equipments and systems for national major equipments and major projects. The project achievements have been successfully applied to more than 2500 units in the large-scale blast furnace TRT equipments and other industrial equipments. The advanced control equipments and systems have the international market competitiveness, and have been exported to some developed countries. In the nearly three years, economic benefit value of 7.29 billion yuan were created. Meanwhile, significant social benefits were also generated for promoting energy conservation and emission reduction.



② 复杂对象的几何表示和计算理论与方法



Geometric Representation and Computation Theory and Methods for Complex Objects

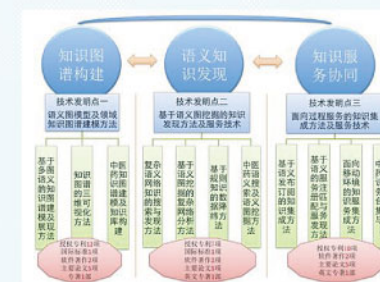
The Project directed by Prof. Bao Hujun from CS College was awarded the National 2nd Prize of Nature & Science Progress in 2013. This research explores discrete geometric computation theory to solve the challenges in effectively modifying and controlling the shapes of mesh surfaces. Its main contributions include: it establishes the geometric computation theories and algorithms in differential domain for polygonal meshes, and invents a series of WYSIWYG (what you see is what you get) interactive mesh editing and processing techniques; proposes a hybrid parametric spline representation and a progressive-iterative spline approximation technique; discovers the quad angulation mechanism and method of optimizing standing wave function for complex mesh surfaces; reveals the rule of spectral shifting between different manifolds, and breaks through the bottleneck in constructing the as-rigid-as-possible mesh parameterization. The 20 representative papers of this research have been cited 1656 times (including 638 SCI citations). This work not only leads the state-of-the-art researches in the field of discrete geometric computation, but also has been successfully applied in manufacturing industry and digital entertainment, resulting in great impact.

③ 基于语义图的知识服务技术及中医药应用

计算机学院吴朝晖教授负责的该项目获2013年高等学校科学研究优秀成果奖（科学技术）技术发明一等奖。项目提出语义图模型来描述知识，用语义过程来建模复杂知识服务流程，从知识图谱建模的多样性、语义知识发现的复杂性和知识服务集成的协同性等三个方面发明了基于语义图的知识服务技术，并应用于中医药领域。获授权专利29项，出版3部专著，制定2项中医药领域的ISO国际标准，发表100余篇论文。成果的创新性、系统性和实用性得到著名学者、行业组织和用户单位的充分肯定，例如：被网格创始人Ian Foster列为全球五个最具影响的网格应用平台之一，获得全国四十余家核心中医药应用机构的普遍认同，获得世界中医药联合会高度评价等。

Semantic Graph Based Knowledge Service Technology and Its Application in Chinese Medicine

The project led by Prof. Wu Zhaohui from CS College won First Prize of Invention Award of Ministry of Education. The project proposed a semantic graph to describe knowledge and used semantic process to model complex knowledge service flow. The team invented semantic graph based knowledge service technology from three aspects - the diversity of knowledge graph model, the complexity of semantic knowledge discovery and the cooperativity of knowledge service integration, and applied the invention to the Chinese Medicine field. The project has achieved 29 patent licenses, published 3 treatises, made 2 ISO international standards in the Chinese medicine field, published over 100 papers. The novelty, systematicness and practicability of the achievements was totally confirmed by prominent scholars, industry groups and the customer units. For example, the achievement is listed as one of the five most significant global grid application platforms by Ian Foster, the founder of grid computing, widely confirmed by over 40 core Chinese Medicine agencies in China, and highly assessed by World Federation of Chinese Medicine.



4 乒乓球对弈仿人机器人研发及相关技术的产业化应用

控制系熊蓉教授负责的该项目获2013年浙江省科学技术奖一等奖。为提高机器人运动的灵活性、响应的快速性和作业的智能性，促进机器人技术在工业、民用等领域的推广应用，控制系机器人团队在国家863重点课题的支持下，通过多年攻关在快速识别预测、自主协调运动和稳定平衡控制等关键技术上取得突破，并完全自主研发了可进行乒乓球对打的仿人机器人系统，实现了连续多回合的与人对打和双机器人对打，是国际上首个具有准确快速连续反应能力的仿人机器人系统，在国内外产生较大影响。突破的相关技术已推广应用，初步实现产业化。

Technologies Study of Intelligent Humanoid Robot

The project lead by Prof. Xiong Rong from Dept. of Control Science and Engineering is devoted to advancing the robots with high agility, fast response and autonomous intelligence and promoting related robotics towards industrial and civil applications. Supported by the national 863 key research project, the team has been focusing on edge-cutting researches in fast object recognition and prediction, autonomous coordinative motion planning and stability and balance control. The team developed a humanoid robot system that can play table tennis, which achieved continuous table tennis rallying between two humanoid robots and between a human player and a robot. This robot system is one of the first humanoid robot systems that can execute fast and continuous response to external environment, and is well-reputed both in China and at abroad. Technologies being developed for this particular system have been generalized for industrial applications. The resultant project "Research, Development and Technique Applications of Humanoid robots Playing Table Tennis" has been awarded 1st Prize Sci & Tech of Zhejiang Province in 2013.

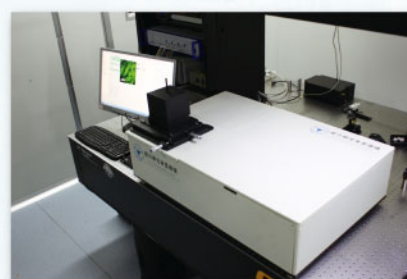
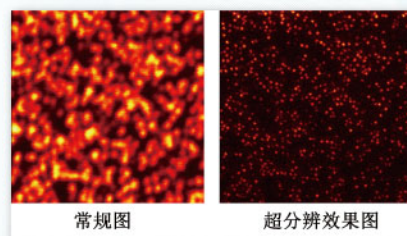


5 突破光学衍射极限的光学显微术

光学超分辨技术是21世纪光学发展的重大突破点。光电系刘旭教授课题组针对荧光显微术，发展了国内首套门控荧光受激发射损耗光学显微系统，实现38纳米的空间分辨率，并在此基础上，实现了亚百纳米分辨的荧光寿命成像。首次提出了荧光发射微分的概念，并结合荧光受激发射损耗使其分辨率进一步提升，研究成果在Optics Letters发表封面论文。另外，基于荧光发射微分技术在低激发功率下，实现了 $\lambda/4.6$ 分辨率。针对非荧光显微术，提出移频机理的超分辨方法，并在实验上实现了 $\sim \lambda/7$ 分辨率，研究成果发表在Optics Letters。上述相关内容应邀在Light: Science & Applications 杂志上发表长篇综述。

Breaking Optical Diffraction Barrier with Optical Super-resolution Microscopy

Optical super-resolution microscopy imaging is one of the key breakthroughs in the development of optical field in the 21st century. In the research of fluorescence super-resolution imaging, Prof. Liu Xu and his group from Dept. of Optical Engineering developed the first set of time-gated stimulated emission depletion (STED) microscopy system in China and realized a spatial resolution of 38nm. Based on this system, they also realized fluorescence lifetime imaging with resolution of <100nm. The group proposed the concept of fluorescence emission difference (FED) for the first time and also introduced this concept into STED imaging to further enhance its resolving ability. The corresponding research has been published on Optics Letters as the cover paper. Moreover, based on the FED concept, Prof. Liu Xu's group realized a super-resolution of $\lambda/4.6$ at low intensity excitation. In the research of label-free optical super-resolution imaging, the group proposed a novel imaging method based on frequency shift and obtained a spatial resolution of $\lambda/7$ in practice. The corresponding research has also been published on Optics Letters. Recently, Prof. Liu Xu's group has been invited by Light: Science & Applications to publish a review about their research.

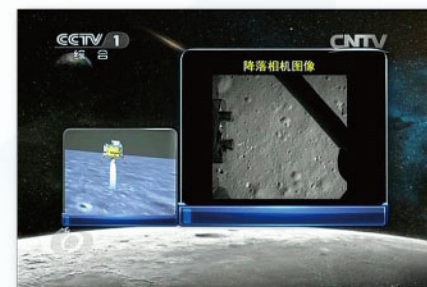


6 嫦娥3号降落相机光学系统

光电系徐之海、冯华君团队在航天镜头光机系统优化设计、深空环境适应性、高精度光学系统装校等关键技术上取得了突破，成功研制了能够在月球表面恶劣的辐射和温度环境中实现高清晰成像的嫦娥3号降落相机光学系统。该光学系统在2013年12月14日21时嫦娥3号实施月面软着陆的过程中表现出色、成像清晰，成功获取了嫦娥3号对月面成像的第一幅照片，记录了惊心动魄的落月视频图像，为我国航天器首次成功实现月面软着陆做出了重要贡献。

The Optical System for the Landing Camera of CE-3

Prof. Xu Zhihai and Prof. Feng Huajun research team from Dept. of Optical Engineering has achieved the breakthrough on the optical-mechanical optimization, deep-space adaptability and high-precision optical calibration of optical system for space exploration, and successfully developed a high quality lens for landing camera of CE-3, which can take high resolution pictures while suffering the severe radiation and temperature condition near the surface of the Moon. On the landing process of CE-3 at 21:00, December 14, 2013, the optical system performed perfectly and took high quality images. It is this optical system that successfully acquired the first picture of the Moon in CE-3 mission, and recorded the video of landing. It took a very important role in the Chinese spacecraft first landing on the Moon.



7 基于机器视觉的月面巡视器环境感知与导航

月面巡视器（月球车）的制导、导航与控制（GNC）遥操作是嫦娥三号探测器的七大关键技术之一。信电系刘济林教授团队从2005年开始，对这一关键技术的相关问题展开系列研究。历时8年，深入研究了广角相机建模与标定、双目立体视觉、三维重建、月面环境评估、视觉里程计定位等诸多基础理论与关键技术，攻克了特殊光照环境下的月面地形环境高精度重建与未知复杂地形环境中月球车的准确定位与场景复现等难题。并于2013年中标后受502所委托，开发了玉兔号月面巡视器的遥操作软件系统，为我国的探月工程贡献了一份力量。

Vision Based Environment Perception and Navigation for Lunar Rovers

Remote control of guidance, navigation and control (GNC) for the lunar rover is one of the seven key technologies for the Chinese Chang'e 3 mission to the Moon. Prof. Liu Jilin from Dept. of Information Science and Electronic Engineering and his team have been studying on the related technologies since 2005. During the past eight years, they worked on a series of fundamental problems, which include wide-angle camera calibration, stereo-vision, 3D reconstruction, lunar surface modeling, visual odometer, etc. More specifically, they conquered two extremely challenging problems: the high-precision 3D reconstruction of lunar surfaces and the lunar rover's simultaneously localization and map building. In 2013, the team bid the project "GNC Remote Control for the Yutu Rover" from Institute 502 and finished the work successfully, making a contribution for the Chang'e 3 mission.

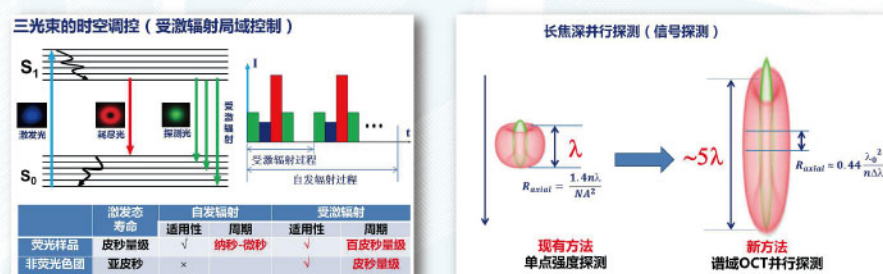


8 基于宽带受激辐射的纳米光学成像技术研究

超衍射极限的纳米光学成像技术,是生物医学光学成像技术的重要进展,必将推动生物医学研究的重大突破。然而,现有纳米光学成像技术在性能上仍存在不足。光电系丁志华教授负责的本项目获2013年国家自然科学基金重点项目资助,旨在提出基于宽带光受激辐射的纳米超分辨光学成像机制,引入基于谱域光学相干层析技术的高灵敏度并行探测方法,实现对非荧光和荧光样品的亚百纳米分辨的快速成像,并显著提高纳米光学成像技术的成像速度。

Optical Nanoscopy Based on Stimulated Emission of Broadband Light

Optical nanoscopy with a resolution beyond the conventional diffraction barrier, a big advance in biomedical optical imaging technologies, will certainly give rise to vital breakthrough in biomedical researches. However, the performance of existing nanoscopy is still need to be improved. The newly funded project led by Prof. Ding Zhihua from Dept. of Optical Engineering, was supported by the Key Program of National Natural Science of China in 2013. It proposes stimulated emission of wideband light for optical super resolution, and utilizes spectral domain optical coherence tomography for parallel high-sensitive signal detection. This novel optical nanoscopy envisions to achieving faster optical imaging at a resolution of sub-hundred nanometers for both non-fluorescent chromophores and fluorescent samples.



3. 年度TOP论文

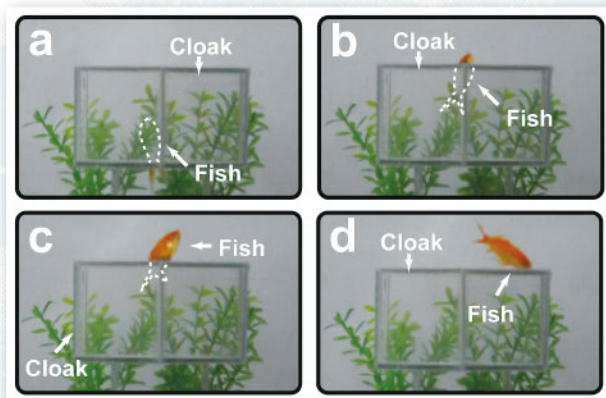
Recommended Papers

1 Ray-optics Cloaking Devices for Large Objects in Incoherent Natural Light

作者: Chen, Hongsheng; Zheng, Bin; Shen, Lian; 等

来源: NATURE COMMUNICATIONS 卷: 4 文献号: 2652

By abandoning the phase preservation requirement, it is possible to create invisibility cloaking for natural light at multiple observation angles. Such a cloaking device operates within the ray-optics approximation and offers good performance for hiding macroscopic objects much larger than the wavelength of light. Compared with the previous unidirectional cloak design, our method can be easily extended in multiple directions for arbitrary polarization over a broad range of optical frequencies. Using widely available optical glass, we constructed polarization-insensitive cloaks that were able to hide a fish in a fish tank and a cat in an ambient air environment.

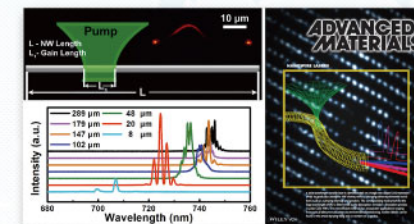


2 Wavelength Tunable CdSe Nanowire Lasers Based on the Absorption-Emission-Absorption Process

作者: Li, Jiabei; Meng, Chao; Liu, Ying; 等

来源: ADVANCED MATERIALS 卷: 25 期: 6 页: 833-837

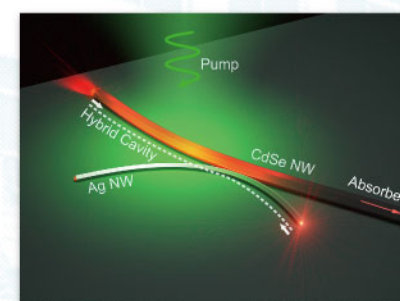
Wavelength controllability and tunability of nanowire lasers is very important for achieving practical applications such as optical communications, environmental monitoring and spectroscopy analysis etc. Wide range wavelength controlling and tailoring of nanowire laser is demonstrated on a single non-doped CdSe nanowire by an effective and simple approach using intrinsic absorption-emission-absorption effect. Furthermore, in this paper, three key factors that influence the wavelength of semiconductor nanowire lasers were first investigated and compared, which were absorption-emission-absorption process (AEA), pulling effects, and band gap renormalization.



3 Hybrid Photon-plasmon Nanowire Lasers

作者: Wu, Xiaoqin; Xiao, Yao; Meng, Chao; 等

来源: NANO LETTERS 卷: 13 期: 11 页: 5654-5659



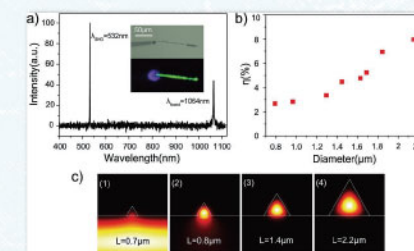
Metallic and plasmonic nanolasers have attracted growing interest recently. Plasmonic lasers demonstrated so far operate in hybrid photon-plasmon modes in transverse dimensions, rendering it impossible to separate photonic from plasmonic components. Thus only the far-field photonic component can be measured and utilized directly. But spatially separated plasmon modes are highly desired for applications including high-efficiency coupling of single-photon emitters and ultra sensitivity optical sensing. Here, we report a nanowire (NW) laser that offers subdiffraction-limited beam size and spatially separated plasmon cavity modes. By near-field coupling a high-gain CdSe NW and a 100 nm diameter Ag NW, we demonstrate a hybrid photon-plasmon laser operating at 723 nm wavelength at room temperature, with a plasmon mode area of $0.008\lambda^2$. This device simultaneously provides spatially separated photonic far-field output and highly localized coherent plasmon modes, which may open up new avenues in the fields of integrated nanophotonic circuits, biosensing, and quantum information processing.

4 Synthesis of Optical-Quality Single Crystal β -BaB₂O₄ Microwires and Nanowires

作者: Qu, Guangyuan; Hu, Zhifang; Wang, Yipei; 等

来源: ADVANCED FUNCTIONAL MATERIALS 卷: 23 期: 10 页: 1232-1237

We report synthesis of optical quality β -Barium borate microwires and nanowires (MNWs) using an organic-free hydrothermal method with $\text{BaCl}_2 \cdot 6\text{H}_2\text{O}$, NaOH and H_3BO_3 as source materials and assisted with post annealing. As-synthesized MNWs, with diameters ranging from 500 nm to 2 μm and lengths up to several hundred micrometers, show good optical wave guiding capabilities. Based on a single BBO MNW waveguide coupled assisted with a fiber taper via evanescent, we evaluate the propagation losses of 0.30 dB/ μm (at 532 nm) and 0.21 dB/ μm (at 671 nm), respectively. Evident second-harmonic generation (SHG) signal at 532 nm with measured conversion efficiency of about 8.4% is observed when excited by wave guided 1064-nm picosecond laser pulses within a 100- μm -level length BBO MNW. The dependence of SHG conversion efficiency on the MNW diameter is also investigated. Our results show a much higher SHG efficiency of BBO single crystal MNW compared to bulk crystal, which suggests its potential applications in future micro-/nanoscale nonlinear optical applications such as optical modulation and frequency conversion.

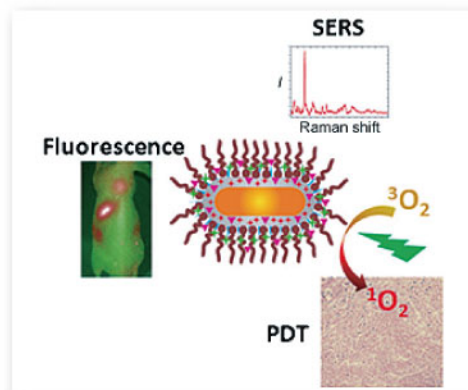


5 Multifunctional Gold Nanorods with Ultrahigh Stability and Tunability for In Vivo Fluorescence Imaging, SERS Detection, and Photodynamic Therapy

作者 : Zhang, Yuan; Qian, Jun; Wang, Dan; 等

来源 : ANGEWANDTE CHEMIE-INTERNATIONAL EDITION 卷: 52 期: 4 页: 1148-1151

We have demonstrated a multilayer-coated GNR, which contained dyes doped in silica and polymer layers, functioning as SERS channel and fluorescence channel, respectively. Its optical properties could be easily tuned, by either adjusting the shell thickness or changing the type of the dyes in each layer. The GNRs have been shown to be ultra stable in water solutions with pH values between 1 and 12, in animal serum, and in living systems. The potentials of such GNRs in simultaneous multimodal tumor detection and photodynamic therapy have also been shown.



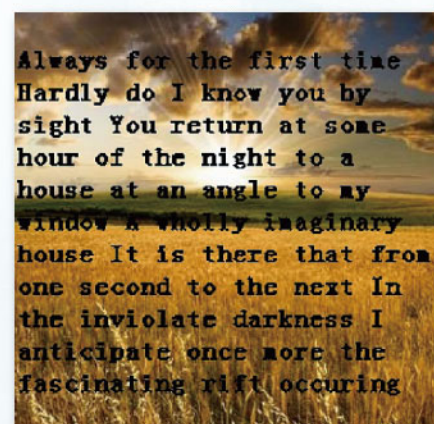
6 Fast and Accurate Matrix Completion Via Truncated Nuclear Norm Regularization

作者 : Hu, Yao; Zhang, Debing; Ye, Jieping; 等

来源 : IEEE TRANSACTIONS ON PATTERN ANALYSIS AND MACHINE INTELLIGENCE

卷: 35 期: 9 页: 2117-2130

Recovering a large matrix from a small subset of its entries is a challenging problem arising in many real applications, such as image inpainting and recommender systems. Many existing approaches formulate this problem as a general low-rank matrix approximation problem. Since the rank operator is nonconvex and discontinuous, most of the recent theoretical studies use the nuclear norm as a convex relaxation. One major limitation of the existing approaches based on nuclear norm minimization is that all the singular values are simultaneously minimized, and thus the rank may not be well approximated in practice. In this paper, we propose to achieve a better approximation to the rank of matrix by truncated nuclear norm, which is given by the nuclear norm subtracted by the sum of the largest few singular values. In addition, we develop a novel matrix completion algorithm by minimizing the Truncated Nuclear Norm. We further develop three efficient iterative procedures, TNNR-ADMM, TNNR-APGL, and TNNR-ADMMAP, to solve the optimization problem. TNNR-ADMM utilizes the alternating direction method of multipliers (ADMM), while TNNR-APGL applies the accelerated proximal gradient line search method (APGL) for the final optimization. For TNNR-ADMMAP, we make use of an adaptive penalty according to a novel update rule for ADMM to achieve a faster convergence rate. Our empirical study shows encouraging results of the proposed algorithms in comparison to the state-of-the-art matrix completion algorithms on both synthetic and real visual datasets.



7 3D Shape Regression for Real-time Facial Animation

作者 : Cao, Chen; Weng, Yanlin; Lin, Stephen; 等

来源 : ACM TRANSACTIONS ON GRAPHICS 卷: 32 期: 4 文献号: 41



We present a real-time performance-driven facial animation system based on 3D shape regression. In this system, the 3D positions of facial landmark points are inferred by a regressor from 2D video frames of an ordinary web camera. From these 3D points, the pose and expressions of the face are recovered by fitting a user-specific blend shape model to them. The main technical contribution of this work is the 3D regression algorithm that

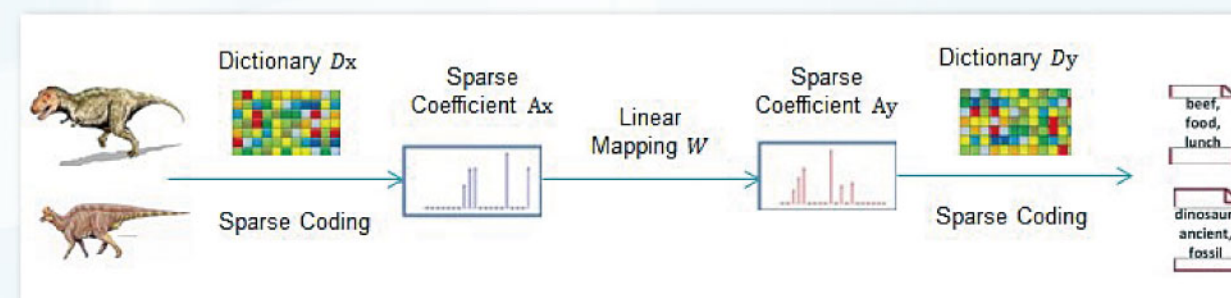
learns an accurate, user specific face alignment model from an easily acquired set of training data, generated from images of the user performing a sequence of predefined facial poses and expressions. Experiments show that our system can accurately recover 3D face shapes even for fast motions, non-frontal faces, and exaggerated expressions. In addition, some capacity to handle partial occlusions and changing lighting conditions is demonstrated.

8 Supervised Coupled Dictionary Learning with Group Structures for Multi-modal Retrieval

作者 : Yueting Zhuang, Yanfei Wang, Fei Wu, Yin Zhang, Weiming Lu

来源 : Proceeding of the Twenty-Seventh Conference on Artificial Intelligence (AAAI, Oral Paper) 1070-1076

A better similarity mapping function across heterogeneous high-dimensional features is very desirable for many applications involving multi-modal data. In this paper, we introduce coupled dictionary learning (DL) into supervised sparse coding for multi-modal (cross media) retrieval. We call this Supervised coupled dictionary learning with group structures for Multi-Modal retrieval (SLIM2). SLIM2 formulates the multimodal mapping as a constrained dictionary learning problem. By utilizing the intrinsic power of DL to deal with the heterogeneous features, SLIM2 extends unimodal DL to multi-modal DL. Moreover, the label information is employed in SLIM2 to discover the shared structure inside intra-modality within the same class by a mixed norm (i.e., L1-2-norm). As a result, the multimodal retrieval is conducted via a set of jointly learned mapping functions across multi-modal data. The experimental results show the effectiveness of our model when applied to cross-media retrieval.

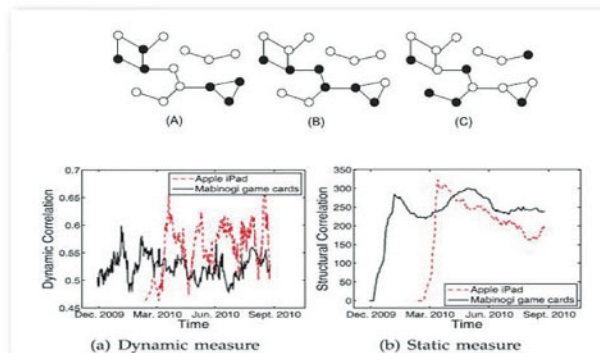


9 Static and Dynamic Structural Correlations in Graphs

作者：Wu, Jian; Guan, Ziyu; Zhang, Qing; 等

来源：IEEE TRANSACTIONS ON KNOWLEDGE AND DATA ENGINEERING 卷: 25 期: 9 页: 2147-2160

Real-life graphs not only contain nodes and edges, but also have events taking place, e.g., product sales in social networks. Among different events, some exhibit strong correlations with the network structure, while others do not. Such structural correlations will shed light on viral influence existing in the corresponding network. Unfortunately, the traditional association mining concept is not applicable in graphs because it only works on homogeneous data sets like transactions and baskets. We propose a novel measure for assessing such structural correlations in heterogeneous graph data sets with events. The measure applies hitting time to aggregate the proximity among nodes that have the same event. To calculate the correlation scores for many events in a large network, we develop a scalable framework, called gScore, using sampling and approximation. By comparing to the situation where events are randomly distributed in the same network, our method is able to discover events that are highly correlated with the graph structure. We test gScore's effectiveness by synthetic events on the DBLP coauthor network and report interesting correlation results in a social network extracted from TaoBao.com, the largest online shopping network in China. Scalability of gScore is tested on the Twitter network. Since an event is essentially a temporal phenomenon, we also propose a dynamic measure, which reveals structural correlations at specific time steps and can be used for discovering detailed evolutionary patterns.

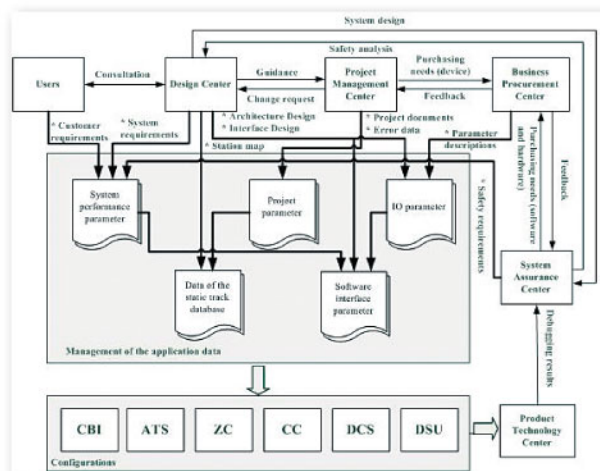


10 Data Configurations in Railway Signaling Engineering — an Application of Enterprise Systems Techniques

作者：Chen, Xiangxian; Guan, Aiai; Qiu, Xinxi; 等

来源：ENTERPRISE INFORMATION SYSTEMS 卷: 7 期: 3 页: 354-374

Railway signaling system is a safety-critical system to ensure railway safety and its development cost is huge. It is of great economic value to apply the generic signaling system into different environment by configurations of different application data. A method is illustrated in this paper to configure the application data completely and accurately, in which the automatic generation technology is introduced to automatically configure the functional logic of safety-critical systems, i.e., Computer Based Interlocking (CBI) system and Automatic Train Protection (ATP) system. All the application data are collected from the workflows among various departments with the combination of Enterprise Information System (EIS). Some application data above are expressed by models in the automatic generation technology, and the functional logic is then obtained by analysis of these models. A configuration platform based on the EIS is developed in this way, both the efficiency and accuracy of the application data configurations are improved significantly. In addition, it avoids the introduction of human errors to the maximum.

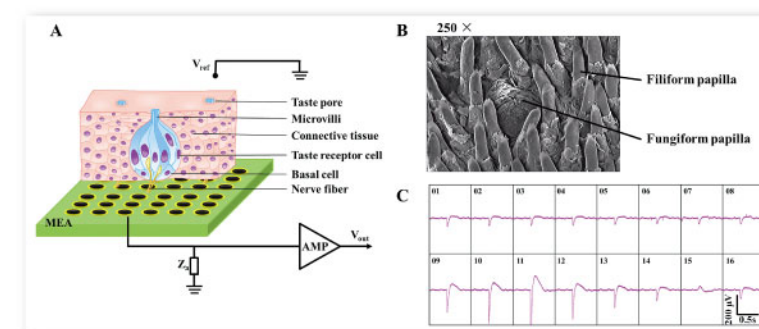


11 Extracellular Potentials Recording in Intact Taste Epithelium by Microelectrode Array for a Taste Sensor

作者：Liu, Qingjun; Zhang, Fenni; Zhang, Diming; 等

来源：BIOSENSORS & BIOELECTRONICS 卷: 43 页: 186-192

Taste receptor cells in taste buds can generate action potentials in response to taste stimuli. The spatiotemporal patterns of the potentials have great value in both biomedical and engineering researches. In the present study, by fixing the biological epithelium onto the surface of microelectrode arrays (MEA), we established a novel taste sensor to record action potentials from the taste receptor cells of rat in response to taste stimuli. By this multi-channel recording method, we examined the electrophysiological activities of taste receptor cells in taste buds to stimuli representing the basic taste qualities (sour, salt, bitter, sweet and umami). The recorded action potentials corresponding to five tastes displayed different spatiotemporal patterns. The multi-channel results demonstrated that taste buds released the spontaneous signals simultaneously and displayed different responding to different tastes stimulation. The temporal characteristics were derived by time-domain and frequency-domain analysis, and the signals fired in different stimuli could be distinguished into different clusters by principal component analysis (PCA). The study provides an effective and reliable platform to recognize and distinguish basic taste qualities.

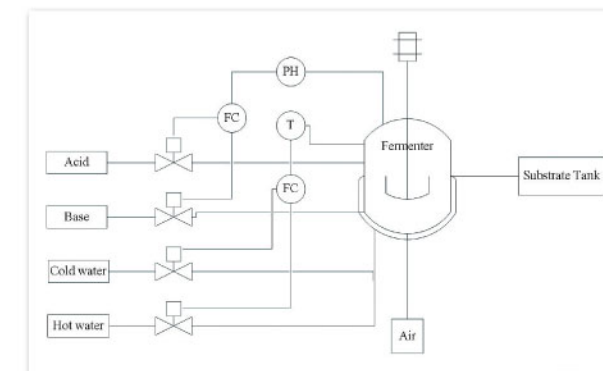


12 Bayesian Inference and Joint Probability Analysis for Batch Process Monitoring

作者：Ge, Zhiqiang; Song, Zhihuan

来源：AIChE JOURNAL 卷: 59 期: 10 页: 3702-3713

This paper develops a new probabilistic monitoring method for batch processes which have multiple operating conditions. Particularly, for multiphase batch processes, a phase-based Bayesian inference strategy is introduced, which can efficiently combine the information of multiple operation modes together into a single model in each specific phase. Therefore, without any process knowledge, local monitoring results in different operation modes can be automatically integrated. Besides, the information of the operation mode can be obtained through joint probability analysis under the Bayesian monitoring framework. Potential extensions of the proposed method for fault diagnosis and identification are also discussed. A benchmark case study on the penicillin fermentation process is given to evaluate the feasibility and efficiency of the proposed method. It is demonstrated that the monitoring performance and the process comprehension have both been improved.

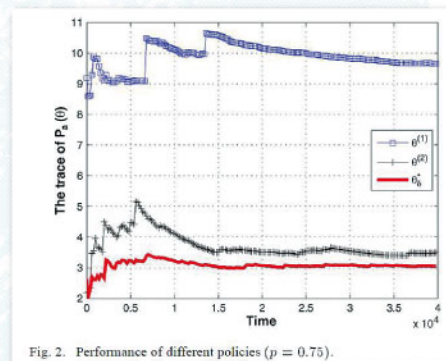
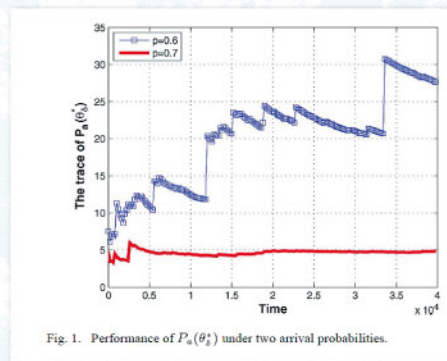


13 Optimal Periodic Sensor Schedule for Steady-State Estimation Under Average Transmission Energy Constraint

作者：Ren, Zhu; Cheng, Peng; Chen, Jiming; 等

来源：IEEE TRANSACTIONS ON AUTOMATIC CONTROL 卷: 58 期: 12 页: 3265-3271

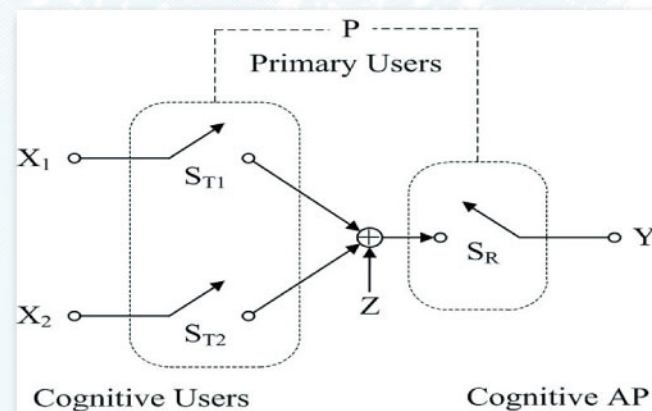
We consider periodic sensor scheduling for remote state estimation under average transmission energy constraint. The sensor decides whether or not to send its data to a remote estimator in order to meet the transmission energy constraint. The transmitted data are likely to be dropped due to the imperfect communication. An optimal periodic schedule is found via the tools from the Markov chain. Furthermore, a sufficient condition of the system dynamics, energy budget, and packet drop rate, under which the remote estimator is guaranteed to be stable, is derived. Examples are provided to show the effectiveness of results.



14 On the Capacity Region of Cognitive Multiple Access over White Space Channels

作者：Zhang, Huazi; Zhang, Zhaoyang; Dai, Huaiyu

来源：IEEE JOURNAL ON SELECTED AREAS IN COMMUNICATIONS 卷: 31 期: 11 页: 2517-2527



Opportunistically sharing the white spaces, or the temporarily unoccupied spectrum licensed to the primary user(PU), is a practical way to improve the spectrum utilization. In this paper, we consider the fundamental problem of rate regions achievable for multiple secondary users (SUs) which send their information to a common receiver over such a whitespace channel. In particular, the PU activities are treated as on/off side information, which can be obtained causally or noncausally by

the SUs. The system is then modeled as a multi-switch channel and its achievable rate regions are characterized in some scenarios. Explicit forms of outer and inner bounds of the rate regions are derived by assuming additional side information, and they are shown to be tight in some special cases. An optimal rate and power allocation scheme that maximizes the sum rate is also proposed. The numerical results reveal the impacts of side information, channel correlation and PU activity on the achievable rates, and also verify the effectiveness of our rate and power allocation scheme. Our work may shed some light on the fundamental limit and design tradeoffs in practical cognitive radio systems.

EDUCATION 人才培养

学部共有11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，21个二级学科博士学位授予点，22个二级学科硕士学位授予点。在校生（包括本科生和研究生）6287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60%。

There are 11 undergraduate programs, 8 doctorate programs of primary discipline, 1 master program of primary discipline, 21 both doctorate and master programs of secondary discipline, and another one master program of secondary discipline. About 6287 full-time undergraduate and graduate students enrolled at the faculty. They have made outstanding achievements in various international or domestic disciplinary competitions. More than 60% undergraduate students can continue their studies at home or aboard.

本科专业 UG Program

院系 Department/College	本科专业 UG Program
光电信息工程学系 Dept. of Optical Engineering	光电信息科学与工程 Optoelectronic Information Science and Engineering
信息与电子工程学系 Dept. of Information Science and Electronic Engineering	信息工程 Information Engineering
	电子科学与技术 Electronic Science and Technology
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	计算机科学与技术 Computer Science and Technology
软件学院 College of Software Technology	数字媒体技术 Digital Media Technology
	软件工程 Software Engineering
	工业设计 Industrial Design
	产品设计 Product Design
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
	测控技术与仪器 Measurement and Control Technology and Instruments

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

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 and Automatic Equipment

系统工程 Systems Engineering

模式识别与智能系统 Pattern Recognition and 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

*只有硕士点

*Only 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 (10级、11级) Undergraduate
光电信息工程学系 Dept. of Optical Engineering	204	320	276
信息与电子工程学系 Dept. of Information Science and Electronic Engineering	216	421	603
控制科学与工程学系 Dept. of Control Science and Engineering	198	394	263
计算机科学与技术学院 College of Computer Science and Technology	465	893	829
生物医学工程与仪器科学学院 College of Biomedical Engineering & Instrument Science	164	272	331
软件学院 College of Software Technology	/	438	/
合计 Total	1247	2738	2302

招生数 (人)
Freshmen

院 系 Department/College	博士生 Doctor	硕士生 (全日制) Master	本科生 (2012级) sophomore
光电信息工程学系 Dept. of Optical Engineering	49	107	139
信息与电子工程学系 Dept. of Information Science and Electronic Engineering	47	148	307
控制科学与工程学系 Dept. of Control Science and Engineering	42	122	141
计算机科学与技术学院 College of Computer Science and Technology	81	308	412
生物医学工程与仪器科学学院 College of Biomedical Engineering & Instrument Science	34	92	171
软件学院 College of Software Technology	/	200	/
合计 Total	253	977	1170

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	46	83	126
信息与电子工程学系 Dept. of Information Science and Electronic Engineering	53	149	326
控制科学与工程学系 Dept. of Control Science and Engineering	30	122	137
计算机科学与技术学院 College of Computer Science and Technology	70	295	369
生物医学工程与仪器科学学院 College of Biomedical Engineering & Instrument Science	21	86	171
软件学院 College of Software Technology	/	162	/
合计 Total	220	897	1129

本科生深造与对外交流

Further Study and International Exchange of Undergraduate

院系 Department/College	毕业生* Graduate*	出国深造率 Ratio of Further Studies Aboard	读研率 Ratio of Further Study at Home	对外交流人次 International Exchange
光电信息工程学系 Dept. of Optical Engineering	115	45.22%	39.13%	32
信息与电子工程学系 Dept. of Information Science and Electronic Engineering	312	20.19%	47.44%	47
控制科学与工程学系 Dept. of Control Science and Engineering	117	32.5%	48.7%	44
计算机科学与技术学院 College of Computer Science and Technology	352	29.26%	25%	109
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	169	14.29%	43.48%	31
合计 Total	1065	26.2%	38.31%	263

*不包括竺可桢学院学生

* Except the students belong to Chu Kochen Honors College

新增国家级精品资源共享课

New National Excellent Resource Sharing Course

序号 No	课程名称 Course	负责人 Director
1	应用光学 Applied Optics	岑兆丰 Prof. Cen Zhaofeng
2	微机原理与接口技术 Principle and Interface Technology of Microprocessors	王晓萍 Prof. Wang Xiaoping
3	C程序设计基础及实验 Fundamentals of C Programming	何钦铭 Prof. He Qinming
4	计算机游戏程序设计 Computer Game Programming	耿卫东 Prof. Geng Weidong
5	嵌入式系统 Principles of Embedded System	陈文智 Prof. Chen Wenzhi
6	软件工程 Software Engineering	陈越 Prof. Chen Yue
7	操作系统 Operating System	李善平 Prof. Li Shanping
8	用户体验与产品创新设计 Use Experience and Product Innovation Design	罗仕鉴 Prof. Luo Shijian

新增国家规划教材

New National Level Official Textbook

教材名称 Name	主 编 Chief Editor	出版社 Press
视觉信息应用技术 Vision Information and Applications	章海军 Zhang Haijun	浙江大学出版社 Zhejiang University Press
光学测试技术 Optical Testing Technology	刘承等 Liu Cheng, etc.	电子工业出版社 Publishing House of Electronics Industry
电子商务案例分析（第2版） Analysis of E-Commerce Case	陈德人等 Chen Deren, etc.	高等教育出版社 Higher Education Press

国际学科竞赛奖

International Disciplinary Competition

竞赛名称 Competition	奖 项 Award	获奖名单及作品 Award List
2013年国际大学生程序设计竞赛 ACM International Collegiate Programming Contest Asia Region (ACM-ICPC)	亚洲赛区金牌（4块） Gold Medalist in Asia Regional Contest	Eternal Reality: 姜凯, 陈伟杰, 俞骁尧 Transmutation: 罗杰巍, 张睿捷, 周雨晨
	亚洲赛区银牌(5块) Silver Medalist in Asia Regional Contest	Stand Still: 卢轶, 陈泽闽, 王夏君 Reload: 李璜, 林希, 龚源 No perfect: 赵利强, 钱彦良, 冯竞宜
	亚洲赛区铜牌(3块) Bronze Medalist in Asia Regional Contest	Reload: 李璜, 林希, 龚源 Dream Pursuers: 李铁瑞, 甘天圣, 单才华
2013年第十七届世界杯比赛 The 17 th Robot World Cup (RoboCup 2013)	小型组冠军 Champion of Small Size League	赵越, 王群, 沈一凡, 童航君, 戴萧何, 李川, 方立
	小仿人组季军 The Third Place of Kid-Size Humanoid League	陈星宇, 俞凌, 文玟, 余冬冬, 金里扬, 黄浩钧, 项川
2013年国际机器人设计大赛 International Design Contest (IDC_Robocon)	冠军 Champion of IDC Robocon	孙岳

国际学科竞赛奖 (续)
International Disciplinary Competition

竞赛名称 Competition	奖 项 Award	获奖名单及作品 Award List
2013年德国红点概念设计大赛 2013 International Design Competition 'Red Dot Design Award'	红点设计大奖 (11项) Red Dot Design Award	作品Next: 胡一, 叶风, 酆轲, 吴佳, 曹应骁, 周奥博 作品Animal Ride: 陶冶, 王冠云, 楼硕圆, 蔡建幸, 陈超, 张钦皓, 洪玉洁, 黄洋 作品Flexible Boat: 巩妍, 潘佳琦, 梁颖捷, 湛惠 作品Stablow: 黄允磊, 周翔, 陈晓薇, 陆南楠 作品Green Tape: 曹金, 曾静华, 李景元, 许昶可, 陈姜楠, 汪欣瑶, 郭睿桢 作品Water Collecting Cover: 曹川, 孙龙笛 作品Water-intimated Floor-marks: 程望舒, 胡雨辰, 李深道, 赵若然 作品Anti-scald Straw: 陆晶, 付玉, 璜琨, 程诚 作品Tree of Hope: 蒋婕雨, 方子硕, 童上, 池承, 胡腾文, 金小能, 郝力滨 作品Shed Box: 陆晶, 付玉, 璜琨, 程诚 作品Anti-scald Straw: 金小能, 姚安琪, 胡腾文, 陶钧冶, 廖宇晗
	红点至尊奖 (7项) Red Dot: Best of The Best	作品Double Warm: 黄滢晨, 项伟, 叶伊雯, 陆南楠, 叶朋, 庞晟立, 林丹燕, 邱懿武 作品Luggage Sitter: 陆南楠, 庞晟立, 张雨尘, 孟鲁桦, 沈月波, 黄滢晨, 项伟, 帅颖斌, 邱懿武 作品Messizon: 酆轲, 叶风, 魏民, 安鹏斌 作品Sunshine Lamp: 张翰阳, 贺俞宵, 王涌, 徐阳捷, 陈如佳 作品Standing Carton: 洪玉洁, 石磊, 严昕林, 郑诚, 刘立园, 吴小芸 作品Magnetic Shower: 金小能, 彭韧, 岐维佳, 池快, 姚安琪 作品Lighting-Up: 赵艺, 郜媛, 魏辛逸, 叶伊雯
	红点提名奖 (1项) Red Dot: Honorable Mentions	作品Skin Spot: 巩妍, 梁颖捷, 项伟, 张雨尘, 任颖
2013年度德国iF概念设计奖 2013 International Design Competition 'iF Award'	iF 概念奖 (2项) iF Concept Design Award	作品Aiding Cup: 酆轲, 史剑, 马瑞, 陈怡伶, 刘奕 作品Natural Breath: 陈泓瑜, 刘恩茂, 孙欣, 王碧翔, 王薇
	iF 特别奖 (1项) iF Special Award	作品Air-Bar : 陶冶, 王冠云, 吴疆, 赵艺钧
2013年度美国国际杰出设计奖 2013 Industrial Design Excellence Awards	IDEA 银奖 (2项) IDEA Silver Award	作品Fire Escape Mask : 蒋婕雨, 方子硕, 胡腾文, 童上, 池承, 金小能 作品 Aiding-Cup: 酆轲, 陈怡伶, 叶风, 项伟, 王念欧, 胡一, 吴佳, 刘奕
	IDEA 铜奖 (1项) IDEA Bronze Award	作品E-Catch Net: 金小能, 郝力滨, 曾悠, 楼小龙, 陶钧冶, 廖宇晗
美国大学生数学建模竞赛 2013 Mathematical Contest in Modeling & Interdisciplinary Contest in Modeling (MCM/ICM)	国际特等奖 Outstanding Winner	朱常友, 白伟成
	一等奖 The 1 st Prize	邹楚杭, 费霄汉
	二等奖 The 2 nd Prize	吕勤毅, 李畅达, 姚宁诗, 马超璇, 刘冬煜, 郑博仑, 谢宇, 杜旭

国内学科竞赛奖
Civil Disciplinary Competition

竞赛名称 Competition	奖 项 Award	获奖名单及作品 Award List
2013年中国机器人大赛暨RoboCup公开赛 China Robot Competition and the RoboCup China Open 2013	仿人组冠军 Champion of Kid-Size Humanoid League	陈星宇, 俞凌, 余冬冬, 黄浩钧, 项川, 汪文广, 郑帆, 陈高翔, 莫焱芳, 李猛, 周海燕, 梅文星
全国大学生数学建模竞赛 China Undergraduate Mathematical Contest in Modeling	一等奖 The 1 st Prize	张宇轩, 任青
	二等奖 The 2 nd Prize	叶豪
全国大学生电子设计竞赛 2013 National Undergraduate Electronic Design Contest	二等奖 The 2 nd Prize	李达, 文鼎柱, 孔祥璐, 郑志祺, 钱财杰, 胡可, 钟一舟, 刘俊洋, 谈晓东
第二届全国大学生虚拟仪器大赛 The 2 nd National Virtual Instrument Contest	嵌入式测控平台一等奖 Embedded Control Platform The 1 st Prize	“创想者”代表队: 李欣田, 施啸天, 李诚龙, 吴超豪
	基于PC的数据采集平台三等奖 Data Collection Platform Based on PC The 3 rd Prize	“Forest”代表队: 樊钰, 史浩, 周嘉彬, 张妙芳
全国大学生摄影及微电影创作大赛 National Undergraduate Photography and Micro-Film Competition	最佳动画片 The Best Cartoon	《Gray's Equation》: 韩天鹤
2013年浙江省大学生程序设计竞赛 Zhejiang Province Programming Contest (ZJP)	特等奖 Grand Prize	Sparkling Daydream (闪耀的白日梦): 姜凯, 陈伟杰, 周雨晨
	金牌 Gold Medal	Escher (埃舍尔): 俞骁尧, 李文超, 吴颖欣 _(:3)_ (躺着也中枪): 卢轶, 宁可, 倪朝浩 Way to Convent (丢节操的路上): 陈泽闽, 罗杰巍, 王夏君
	银牌 Silver Medal	lzsf & 5L (楼主沙发和五楼): 何淇丹, 赵无瑕, 陈亨泓 Ramble (嬛嬛一袅待酒浇): 方子君, 吴海麒, 钱彦良
	铜牌 Bronze Medal	Wings (文思代码涌): 张闻, 陈凌云, 朱喆

专项奖

Special Awards

获奖学生 Winners	奖 项 Award	院 系 Department/College
郝 翔 Hao Xiang	2012-2013学年浙江大学 竺可桢奖学金（研究生） Chu Kochen Scholarship	光电信息工程学系 Dept. of Optical Engineering
胡 宁 Hu Ning	2012-2013学年浙江大学 竺可桢奖学金（研究生） Chu Kochen Scholarship	生物医学工程与仪器科学学院 College of Biomedical Engineering & Instrument Science
王治飞 Wang Zhifei	2012-2013学年浙江大学 竺可桢奖学金（本科生） Chu Kochen Scholarship	光电信息工程学系 Dept. of Optical Engineering
马彦楠 Ma Yannan	2012-2013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
	中为奖助学金 Zhongwei Scholarship and Grant	15
	舜宇奖学金 Sunny Scholarship	78
	宝成奖学金 Pou Chen Scholarship	12
	曹光彪奖学金 Chao Kuang Piu Scholarship	19
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新人奖 ISEE New Investigator Award	47
	ISEE单项贡献奖 ISEE Contribution Award	10

院系设立的奖学金（续）

Scholarships of Department/College

院系名称 Department/College	奖学金名称 Scholarship	获奖人数 Awarded Number
信息与电子工程学系 Dept. of Information Science and Electronic Engineering	ISEE助学金 ISEE Grant	10
	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
	浙大信电—高逸奖助学金 GaoYi Scholarship and Grant	10
控制科学与工程学系 Dept. of Control Science and Engineering	仁爱奖学金 Ren Ai Scholarship	16
	春晖奖学金 Chunhui Scholarship	3
	E+H奖学金 E+H Scholarship	10
	中控奖学金 Zhongkong Scholarship	26
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	44
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 Texas College Scholarship	12
	中为奖助学金 Zhongwei Scholarship and Grant	14

教育教学亮点 Teaching Highlights

本科专业核心课程“物理光学”教改项目

The Undergraduate Core Major Course "Physical Optics" Reforming Program

院系：光电信息工程学系
负责人：方伟副教授

Department: Optical Engineering
Director: Associate Prof. Fang Wei



光电系持续推进本科教学改革，成效显著。专业核心课程“物理光学”开设“改革试点班”，开展“以学为主”的教学模式尝试。课程通过一系列措施，加强学生在课堂上的教学参与度，培养学生课外的自主学习习惯和团队合作精神，激发学生深入研究和拓展学习的兴趣。在两位青年教师方伟、李强副教授和两位博士生助教的辛勤努力下，教学班取得了超预期的教学效果，获得了校督导、专家及选课学生的高度评价。

The Dept. of Optical Engineering keeps encouraging instructors to reform teaching methods, and has made significant progresses in 2013. For example, "autonomous learning" has been putting into practice in the undergraduate core major course "physical optics". In this course, students were required to be more active in the class. They needed to put a lot of time to learn by themselves or by discussion with other students. And a presentation on the frontier application of modern optics was also required for each student. Under the instruction of two associate professors Fang Wei and Li Qiang, together with two teaching assistants, such student-centered learning practice in this course was very successful, and got high complimentary from both students and the supervisor from the university.

梳理知识体系，贯通课程体系，完善培养方案，培养创新人才

Aiming at Innovative Talents, Reviewing and Revising Curriculum and Academic Programs

院系：信息与电子工程学系
负责人：章献民教授

Department: Information Science and Electronic Engineering
Director: Prof. Zhang Xianmin

针对电子信息产业人才需求的时代特点，将电子科学与技术、信息工程两个本科专业分别定位于国际通行的电子工程专业（EE）和电子与计算机工程（ECE）专业，统筹规划全系课程体系建设，实现本硕博课程体系贯通，构建与国际接轨的培养方案。以知识点为主线，拓展专业基础，优化教学内容，强化实验实践教学环节。探索电子信息类专业多元化人才培养模式，使学生具有社会和市场需要的合理而全面的专业知识结构，为卓越人才培养提供有力保障。

Aiming at the talent demands of the electronics and information technology industry, ISEE revised its academic programs. Two undergraduate programs, Electronic Science & Technology and Information Engineering, are set respectively parallel with two international common major, Electrical Engineering (EE) and Electrical and Computer Engineering (ECE). A curriculum system was designed available for both undergraduate and post-graduate students after all courses were reviewed. This curriculum system is expected to provide courses for international student training.



教育教学亮点（续） Teaching Highlights

海上智能除油机器人获第41届日内瓦国际发明金奖

Smart Marine Oil Spill Cleaner (Gold Medal of 41st Geneva International Invention Exhibition)

院系：控制科学与工程学系

负责人：本科生王昊飞/指导教师卢建刚教授

Department: Control Science and Engineering

Director: Mr. Wang Haoifei (Undergraduate Student) / Prof. Lu Jiangang (Supervisor)



2013年4月12日，由控制系大四学生王昊飞同学领衔的多学科交叉团队在卢建刚教授指导下发明的海上智能除油机器人，喜获第41届日内瓦国际发明金奖，为我国大学生在科技创新的国际舞台上争得了荣誉。新华网先后以《日内瓦发明展：创新产品解难题》、《中国创新闪耀日内瓦国际发明展》为题，重点报道了该获奖成果。随后，人民网、凤凰网、中国日报、科技日报等多家权威主流媒体也纷纷对此进行转载报道。

In April 12, 2013, the invention of smart marine oil spill cleaner, which was invented by undergraduate student Wang Haoifei and his multidisciplinary team under the guidance of Professor Lu Jiangang, won the Gold Medal of 41st Geneva International Invention Exhibition, and brought honors to Chinese college students on the international stage of science and technology innovation. This invention was one of the focuses in the continuous reports by Xinhua News Agency with the titles of "Geneva International Invention Exhibition: Innovative Products Solve Difficult Problems" and "Chinese Inventions Shine at Geneva International Invention Exhibition". Subsequently, People.cn, ifeng.com, China Daily, Science and Technology Daily, and many other authoritative mainstream news media reproduced these reports.

浙大、西澳大学联合教学课程——《动力、振动和声》

International Joint Teaching between ZJU and UWA— "Dynamics, Vibration and Sound"

院系：生物医学工程与仪器科学学院

负责人：潘杰教授

College: Biomedical Engineering and Instrument Science

Director: Prof. Pan Jie

《动力、振动和声》课程由浙大“千人计划”教授潘杰主讲，并邀请西澳大学著名教授共同参与面向浙大和西澳大学两校学生的全英文课程，该课程采用在线教学、网络课堂等新型的教育技术手段，网络和面授相结合的教学方法，是浙大第一门通过网络平台传输的跨国同时异地课程。这种全新的教学模式，有助于提高学生自主学习能力，开拓学生国际视野，提升课堂教学质量，推动学生的国际化培养。

"Dynamics, Vibration and Sound" is lectured by Prof. Pan Jie. It is an international joint unit for students at both Zhejiang University (ZJU) and the University of Western Australia (UWA), which is taught in English and jointly hosted and sponsored by ZJU and UWA. This unit is an initiative of Zhejiang University to investigate the effectiveness of online techniques and combine internet and classroom delivery of lectures. The new teaching method will improve student's capability for independent learning at the international level. Such teaching practices encourage improvement of teaching quality, benefit the development of excellent minds, and are consistent with the requirements of modern global education.



INTERNATIONAL EXCHANGE 国际交流

学部2013年教师出访参加学术会议、合作交流355人次，接待178人次国外学者来访进行学术交流，举办国际会议8次。学部启动与荷兰爱因霍芬工业大学（TU/e）联合研究中心建设，并继续推动浙江大学—美国康州大学海洋信息技术联合实验室筹建。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，进一步提升了学部的科研和教学水平。

About 355 person-time visited abroad for academic conference and the cooperation research. More than 178 world-renowned scholars were invited to visit FIT for lectures and academic communication. About 8 international conferences were held successfully. It was considered to establish the joint research centre between FIT and TU/e. The construction of ZJU-UConn Joint Laboratory for Underwater Information Science and Technology was promoted continuously. 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	第十届IEEE国际控制与自动化会议 The 10 th IEEE International Conference on Control and Automation	Jun.12-14
2	国际计算与组合会议 International Computing and Combinatorics Conference	Jun. 21-23
3	国际计算可视媒体会议 International Conference on Computational Visual Media Conference	Sept. 19-20
4	第四届“环太平洋水下声学”国际会议（PRUAC） The 4 th Pacific Rim Underwater Acoustics Conference	Oct. 9-11
5	第十届IEEE国际移动专用网络及传感器系统会议 The 10 th IEEE International Conference on Mobile Ad-hoc and Sensor Systems	Oct. 14-16
6	国际先进计算智能会议 International Conference on Advanced Computational Intelligence	Oct. 19-21
7	无线通信与信号处理国际学术会议 International Conference on Wireless Communications and Signal Processing	Oct. 24-26
8	高级数据挖掘与应用国际学术会议 International Conference on Advanced Data Mining and Application	Dec. 14-16

NEWS 2013 2013要闻

1月7日，宋永华常务副校长赴信息学部调研

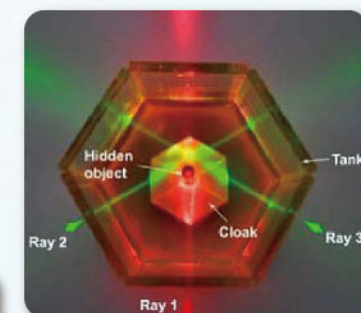
On Jan. 7, Executive Vice President Song Yonghua of ZJU investigated FIT.



1月21日，信息学部举行专门委员会全体会议
The special committee meeting of FIT was held on Jan. 21.

5月17日，2012年度浙江大学十大学术进展评选揭晓，信息学部陈红胜隐身衣进展入围十大，2项获十大提名

On May 17, ZJU Top Ten Academic Progresses in 2012 was unveiled. FIT has 1 project studied on electromagnetic invisibility cloak by Prof. Chen Hongsheng on the list of Top Ten and 2 projects nominated.





6月12日，信息学部第三届青年教师奖授予10位40岁以下的青年教师

On Jun. 12, the awarding ceremony for the 3rd Young Teacher Award of FIT was held, 10 excellent young teachers under 40 years old won the prize.



6月12日，信息学部举办浙江大学学术年会系列高端学术报告

On Jun. 12, the high-level series report of the first ZJU academic annual meeting was held by FIT.



6月28日，以“青年教师成长与成才之路”为主题的学部青年教师论坛活动成功举办

On Jun. 28, the FIT Young Teacher Forum, on the theme of “The Growth of Young Teacher”, was held successfully.

7月10日，赛博（CYBER）协同创新中心在杭州召开暑期工作会

On Jul. 10, the summer meeting of Cyber Innovation Joint Research Center was held in Hangzhou.



9月3日，荷兰爱因霍芬工业大学副校长代表团一行访问信息学部

On Sept. 3, delegation from Eindhoven University of Technology visited FIT.



9月27日，林建华校长赴信息学部调研

On Sept. 27, President Lin Jianhua of ZJU investigated FIT.

10月-12月，赛博（CYBER）协同创新中心多次召开建设方案研讨会

Between October and December, Cyber Innovation Joint Research Center gave several symposiums on the construction scheme.



控制系孙优贤院士2013年当选国际自控联（IFAC）Fellow

Prof. Sun Youxian, the Academician of Chinese Academy of Engineering, was elected to a Fellow of IFAC in 2013.



光电系仇旻教授2013年当选美国光学学会会士和国际光学工程学会会士

Prof. Qiu Min from Dept. of Optical Engineering was elected to a Fellow of the Optical Society of American (OSA) and the International Society for Optics and Photonics (SPIE) in 2013.



控制系陈积明教授获得霍英东基金会第十四届高等院校青年教师奖二等奖

Prof. Chen Jiming from Dept. of Control Science and Engineering was bestowed the 2nd Award of Henry For 14th Young Teacher Education Foundation.

信电系钟财军副教授荣获第8届IEEE亚太地区杰出青年研究员奖

Associate Prof. Zhong Caijun from Dept. of Information Science and Electronic Engineering won the 8th IEEE Asia-Pacific Outstanding Young Researcher Award.

