FIT

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

Annual Report 2016
年报

学部概况
INTRODUCTION TO FIT

信息学部涵盖了光电科学与工程学院、信息与电子工程学院、控制科学与工程学院、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23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) comprised of six colleges, namely, College of Optical Science & Engineering (COSE), College of Information Science and Electronic Engineering (ISEE), College of Control Science and Engineering (CSE), College of Computer Science and Technology (CCST), College of Biomedical Engineering & Instrument Science (BME) and College of Software Technology (CST). Currently, FIT has 9 primary disciplines, in which there are 3 national key disciplines, Optical Engineering, Control Science and Technology, and Biomedical Engineering. In addition, 2 secondary disciplines, Computer Applied Technology, Communication and Information Systems, are also national key disciplines. Under its administration, there are 3 State Key Laboratories, 1 National Special Laboratory, 1 National Engineering Laboratory, 3 National Engineering Research Centers, 23 research institutes, to devote to the innovation research on information science and technology.

主任：鲍虎军
Dean : Bao Hujun

副主任：李尔平
Vice-Dean : Li Erping

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

浙江大学信息学部
Annual Report 2016
FACULTY OF INFORMATION TECHNOLOGY
ZHEJIANG UNIVERSITY

AnnualReport **2016**

Faculty of Information Technology
Zhejiang University

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Faculty of Information Technology
Zhejiang University

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学术交流与合作专门委员会
Academic Exchange and Cooperation Committee

人力资源专门委员会

- 主 任：鲍虎军　　副主任：刘 旭
- 委 员　陈 纯　陈耀武　李尔平　李劲松　刘 承
　　　　仇 旻　荣 冈　徐 文　孙守迁　孙优贤
　　　　童利民　吴朝晖　张光新　章献民　张朝阳
　　　　周 昆　庄越挺

另外5名教授委员由学部在各院系学术委员会中随机抽取产生。

Human Resources Committee

- **Director**：Bao Hujun　　**Vice- Director**：Liu Xu
- **Committee members**：

Chen Chun	Chen Yaowu	Li Erping
Li Jingsong	Liu Cheng	Qiu Min
Rong Gang	Xu Wen	Sun Shouqian
Sun Youxian	Tong Limin	Wu Zhaohui
Zhang Guangxin	Zhang Xianmin	Zhang Zhaoyang
Zhou Kun	Zhuang Yueting	

The other 5 committee members are selected randomly from the academic committee of colleges.

学位评定委员会

- 主 任：李尔平　　副主任：李 光
- 委 员　鲍世宁　陈 刚　何钦铭　何湘宁　黄 海
　　　　黄志尧　林兰芬　宁钢民　仇 旻　孙守迁
　　　　王小松　许正平　杨建义　赵民建　郑臻荣

Academic Degrees Committee

- **Director**：Li Erping　　**Vice- Director**：Li Guang
- **Committee members**：

Bao Shining	Chen Gang	He Qinming	He Xiangning
Huang Hai	Huang Zhiyao	Lin Lanfeng	Ning Gangmin
Qiu Min	Sun Shouqian	Wang Xiaosong	Xu Zhengping
Yang Jianyi	Zhao Minjian	Zheng Zhenrong	

学部学院 COLLEGE OF

光电科学与工程学院
Optical Science & Engineering

信息与电子工程学院
Information Science & Electronic Engineering

控制科学与工程学院
Control Science & Engineering

计算机科学与技术学院
Computer Science & Technology

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

软件学院
Software Technology

信息学部
Faculty of Information Technology

学术委员会

- 荣誉主任　孙优贤
- 主 任　鲍虎军　　副主任　刘 旭
- 委 员　陈 纯　陈耀武　程 鹏　龚小谨　李尔平
　　　　李劲松　刘 承　钱 骏　仇 旻　荣 冈
　　　　孙守迁　童利民　吴朝晖　徐 文　张光新
　　　　张明晖　章献民　张朝阳　周 昆　朱建科
　　　　庄越挺　彭金荣　严晓浪　应义斌

Academic Committee

- **Honorary Director**：Sun Youxian
- **Director**：Bao Hujun　　**Vice- Director**：Liu Xu
- **Committee members**：

Chen Chun	Chen Yaowu	Cheng Peng
Gong Xiaojin	Li Erping	Li Jingsong
Liu Cheng	Qian Jun	Qiu Min
Rong Gang	Sun Shouqian	Tong Limin
Wu Zhaohui	Xu Wen	Zhang Guangxin
Zhang Mingwei	Zhang Xianmin	Zhang Zhaoyang
Zhou Kun	Zhu Jianke	Zhuang Yueting
Peng Jinrong	Yan Xiaolang	Ying Yibin

学术交流与合作专门委员会

- 主 任　李尔平　　副主任　仇 旻
- 委 员　陈积明　田景奎　张朝阳　周 昆

Academic Exchange and Cooperation Committee

- **Director**：Li Erping　　**Vice- Director**：Qiu Min
- **Committee members**：

　Chen Jiming　Tian Jingkui　Zhang Zhaoyang　Zhou Kun

师资队伍
Talent Team

教职员工681人，其中教学科研岗407人，教授199人，副教授181人。有中国工程院院士4人，教育部长江特聘教授11人（另有8位长江讲座教授），973首席科学家6人，"百千万人才工程"国家级人选9人，国家教学名师1人，浙江省特级专家7人，国家自然科学基金杰出青年基金获得者15人，优秀青年基金获得者9人。国家自然科学基金创新群体3个，教育部创新团队2个。

2016年新增"万人计划"科技创新领军人才2人，科技部科技创新领军人才1人，国家杰出青年基金获得者2人，享受政府特殊津贴人员1人，浙江省有突出贡献中青年专家1人。

FIT has 681 faculty and staff members, including 407 faculty members, among which 199 are full professors and 181 are associate professors. There are 4 members of the Chinese Academy of Engineering,

11 Special-term professors (8 chair professors besides) specially engaged in the National Cheung Kong Scholar Program, 6 Chief Scientists of National "973" Program, 9 professors elected the National Bai-Qian-Wan Talents, 1 National Renowned Teacher, 7 Zhejiang Province Outstanding Experts, 15 National Distinguished Youth Science Foundation Fellows, 9 National Excellent Youth Science Foundation Fellows. 2 Innovative Research Groups of the NSFC and 3 Innovative Research Teams of Ministry of Education have been constructed.

In 2016, 2 professors were elected as Sci&Tech Innovation Leader in National High-level Talents Special Support Plan, 1 professor was elected as MOST Sci&Tech Innovation Leader,

2 professors were appointed as National Distinguished Youth Science Foundation Fellow, 1 professor won Government Special Allowance, 1 professor was entitled as Zhejiang Province Youth Expert with Outstanding Achievement.

师资队伍职称结构
Professional Structure

- 教授 Prof.
- 副教授 Associate Prof.
- 其他 Others

2016年新增 Awarded in 2016

"万人计划"科技创新领军人才
Sci &Tech Innovation Leaders in National High-level Talents Special Support Plan

童利民
Tong Limin

苏宏业
Su Hongye

科技部科技创新领军人才
MOST Sci &Tech Innovation Leader

陈 刚
Chen Gang

享受政府特殊津贴专家
Government Special Allowance Winner

李劲松
Li Jingsong
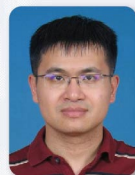
青年专家
Youth Experts

巫英才
Wu Yingcai

江大伟
Jiang Dawei

金潮渊
Jin Chaoyuan

杨 旸
Yang Yang

卓 成
Zhuo Cheng

杰出青年基金获得者
National Distinguished Youth Science Foundation Fellows

陈红胜
Chen Hongsheng

吴 飞
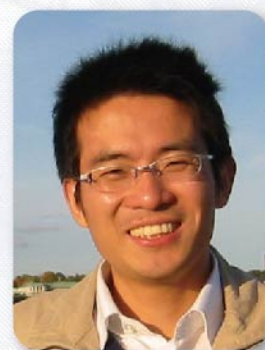Wu Fei

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

苏宏业
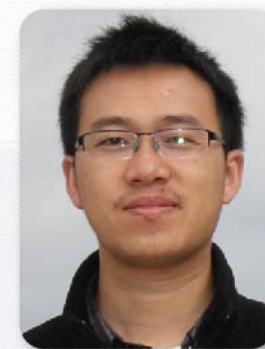Su Hongye

徐之海
Xu Zhihai

教授
Professors

沈伟东
Shen Weidong

时尧成
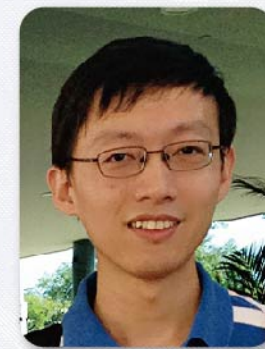Shi Yaocheng

徐 杨
Xu Yang

教授
Professors

虞小鹏
Yu Xiaopeng

葛志强
Ge Zhiqiang

刘 勇
Liu Yong

周 泓
Zhou Hong

王 锐
Wang Rui

邓水光
Deng Shuiguang

谢 磊
Xie Lei

董 玮
Dong Wei

车录锋
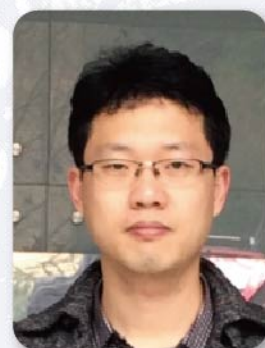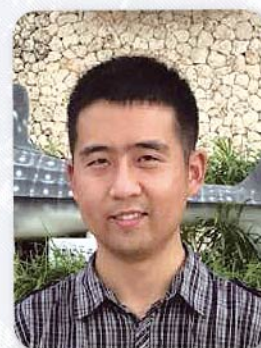Che Lufeng

副教授
Associate Professors

李 鹏
Li Peng

叶德信
Ye Dexin
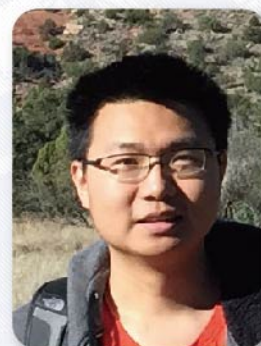
张 帆
Zhang Fan

刘之涛
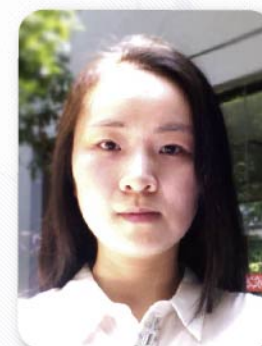Liu Zhitao

张 宇
Zhang Yu

吴鸿智
Wu Hongzhi

廖子承
Liao Zicheng

赵 洲
Zhao Zhou

副教授
Associate Professors

陈 实
Chen Shi

尹巍巍
Yin Weiwei

鲁伟明
Lu Weiming

邱 显
Qiu Xian

引进教师 New Faculty Members

任沁源 Ren Qinyuan	许威威 Xu Weiwei	卓 成 Zhuo Cheng	叶德信 Ye Dexin	郭 欣 Guo Xin	佘 玄 She Xuan	江大伟 Jiang Dawei	陈 焰 Chen Yan
李英明 Li Yingming	纪守领 Ji Shouling	唐龙华 Tang Longhua	余显斌 Yu Xianbin	车录锋 Che Lufeng	曹 臻 Cao Zhen	陈晓明 Chen Xiaoming	王玉兴 Wang Yuxing
黄科杰 Huang Kejie	储 涛 Chu Tao	阮 伟 Ruan Wei	陈 冰 Chen Bing	杨 洋 Yang Yang	潘 宇 Pan Yu	喻 洁 Yu Jie	

科学研究

Scientific Research

2016年度学部到校科研经费逾6亿元，5个学院均超亿元。国家自然科学基金获批65项，合计经费7344万元，其中创新群体1项，杰青2项，重点项目2项，重大仪器专项3项。新增千万级项目共12项。被SCI收录论文730篇，其中ZJU TOP论文占44%。获国家授权发明专利323项。获国家科技进步二等奖1项，教育部高等学校科技进步一等奖1项。新增1个浙江省重点实验室和2个国际联合研究中心（含联建）。

In 2016, the total research funding of FIT reached over 600 million RMB, Moreover, the research funding in every college was more than 100 million. In total, 65 grants with the amount up to 73.44 million RMB were approved by the National Natural Science Foundation of China (NSFC) , including 2 national distinguished youth science project, 2 national key projects, 2 Major Instrument projects. Meanwhile, there were 12 new supported projects with over ten million each, 730 issued papers were indexed by SCI, including 44% list in ZJU top journals. In total, 323 national patents have been approved this year. There was 1 national Sci & Tech Progress Prize awarded the second class. Furthermore, 1 key lab of Zhejiang Province and 2 Joint International Research Center were established in 2016.

国家研究基地 National Research Bases

国家重点（专业）实验室
State Key (Special) labs

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

国家研究基地
National Research Bases

国家工程中心
National Engineering Research Centers

- 国家光学仪器工程技术研究中心
  National Engineering Resarch Centre for Optical Instrumentation
- 工业自动化国家工程研究中心
  National Engineering Research Centre of Industrial Automation
- 国家列车智能化工程技术研究中心
  National Engineering Research Centre for Train Intelligent

研究所 Institutes

学院 College of	研究所名称 Institute	所长 Director
光电科学与工程学院 Optical Science & Engineering	光学工程研究所 Inst. of Optical Engineering	白 剑 Prof. Bai Jian
	光学成像工程研究所 Inst. of Optical Imaging Engineering	冯华君 Prof. Feng Huajun
	微纳光子学研究所 Inst. of Microphotonics and Nanophotonics	仇 旻 Prof. Qiu Min
	光电信息检测技术研究所 Inst. of Optoelectronic Information Detection Technology	严惠民 Prof. Yan Huimin
	光电子技术研究所 Inst. of Optoelectronic Technology	沈永行 Prof. Shen Yonghang
	光电工程研究所 Inst. of Optical and Photonical Engineering	刘 旭 Prof. Liu Xu
	激光生物医学研究所 Inst. of Laser Biomedicine	丁志华 Prof. Ding Zhihua
	光及电磁波研究中心 Center for Optical & Electromagnetic Research	何赛灵 Prof. He Sailing
	光学惯性技术工程中心 Center for Optical Inertial Technology	刘 承 Prof. Liu Cheng
信息与电子工程学院 Information Science and Electronic Engineering	信息与通信网络工程研究所 Inst. of Information, Communication and Network Engineering	虞 露 Prof.Yu Lu
	智能通信网络与安全研究所 Inst. of Intelligent Communication Network and Security	赵民建 Prof. Zhao Minjian
	信号空间和信息系统研究所 Inst. of Signal Space and Information System	徐 文 Prof. Xu Wen
	微纳电子研究所 Inst. of Microelectronics and Nanoelectronics	程志渊 Prof. Cheng Zhiyuan
	超大规模集成电路设计研究所 Inst. of VLSI Design	张 明 Prof. Zhang Ming
控制科学与工程学院 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	黄志尧 Prof. Huang Zhiyao
	智能系统与控制研究所 Inst. of Cyber-Systems and Control	苏宏业 Prof. Su Hongye
计算机科学与技术学院 Computer Science and Technology	人工智能研究所 Inst. of Artificial Intelligence	吴 飞 Prof. Wu Fei
	计算机软件研究所 Inst. of Computer Software	陈 刚 Prof. Chen Gang
	计算机系统结构与网络安全研究所 Inst. of Computer System and Security	何钦铭 Prof. He Qinming
	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 Biomedical Engineering & Instrument Science	生物医学工程研究所 Inst. of Biomedical Engineering	李劲松 Prof. Li Jingsong
	数字技术及仪器研究所 Inst. of Digital Technology & Instrument	陈耀武 Prof. Chen Yaowu

科研亮点 Research Highlights

1. 学部青年创新奖 | Youth Innovation Awards

研究方向： 无线通信与无线网络

简介： 主要从事5G通信前沿领域的研究工作，解决了D2D系统的通信模式选择和分布式资源优化，以及LTE-U系统的LTE/WiFi共存机制、移动业务智能卸载和能效优化问题。相关成果被国内外学者引用1900余次(Google学术引用)，单篇最高引用220次，H因子达到26。2016年获评IEEE通信学会亚太地区杰出青年研究员奖。

Wireless Communication and Networking

The researcher mainly focuses on frontier technologies of the fifth-generation wireless networks. His research contributions include designing distributed resource allocation and mode selection schemes for D2D communications, as well as developing coexistence mechanisms, intelligent mobile offloading strategies, and energy-efficient resource allocation algorithms for LTE-U systems. His papers have received more than 1900 citations while the highest one has more than 220 citations. He received the IEEE Com Soc Asia-Pacific Outstanding Young Researcher Award in 2016.

信电学院
余官定 副教授

研究方向： 光电检测与遥感

简介： 主要从事光电检测与遥感方面的研究，近年来主要工作集中于大气气溶胶的高精度激光雷达探测方面。提出采用视场展宽型迈克尔逊干涉仪(FWMI)作为高光谱分辨率激光雷达(HSRL)的光谱鉴频器，突破了经典HSRL光谱鉴频器在工作波长/视场角等方面的限制，为研制多波长HSRL提供了有效手段；提出采用离轴反射式光学收发系统实现无盲区探测，突破了普通气溶胶遥感HSRL依赖于大气状态参数输入的限制，实现大气气溶胶光学特性的精确探测。

Optical Testing & Remote Sensing

The researcher focuses on optical testing and remote sensing, with special focus on accurate detection of atmospheric aerosols with lidars. He proposed to employ the field-widened Michelson interferometer (FWMI) as the spectral discrimination filter of high-spectral-resolution lidars (HSRLs) for profiling the optical properties of atmospheric aerosols. By using the off-axis aspheric transmitting-receiving system, his group is developing an HSRL that can simultaneously detect the temperature and optical properties of the atmospheric aerosols with very high accuracy.
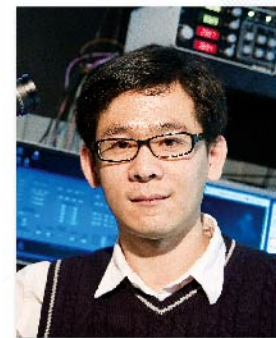
光电学院
刘 东 副教授

研究方向： 生物医学光子学与细胞生物学的应用研究

简介： 通过多学科交叉紧密合作，取得多项创新成果：1) 建立了高分辨显微成像方法达到细胞内轴向40纳米的光学分辨率成像；2) 将光遗传学技术与显微成像技术相结合，实现对蛋白分子活动的操控与光学成像，首次实现对复杂胰岛素信号通路的剖析与精准控制；3) 显微图像的定量处理分析与算法开发，揭示了细胞内物质运输动态规律与疾病的发生机理。在Journal of Cell Biology、Nature Methods等刊物发表多篇论文。

Biomedical Photonics and Cell Biology Applications

By using multidisciplinary approaches, the researcher has accomplished in the following topics: establishment of high-resolution microscopic imaging method which enables axial resolution of 40 nm in cellular imaging; integration of opt genetics with live cell imaging that permits the manipulation and visualization of the dynamics of protein molecules in cells; and development of quantitative image analysis toolkits to analyze single vesicle trafficking in live cells.

生仪学院
许迎科 副教授

研究方向： 新型半导体器件

简介： 主要从事新型半导体（尤其是锗）器件工艺及器件物理领域的研究。在锗基栅极堆垛、源漏工程和沟道应变工程等方面取得了进展，在国际上首次实现了超越硅基器件的锗基CMOS器件。同时，提取了锗沟道中载流子有效质量等基本参数，建立了锗沟道中载流子输运的普适模型。相关论文成果有130余篇，SCI引用1450余次。

Semiconductor Devices

The researcher focuses on the semiconductor device technologies, especially the germanium (Ge)-based devices. He has revealed the first Ge CMOS with a performance exceeding that of Si CMOS, established the experimental study of inversion carrier effective mass in Ge channels and built up the carrier transport model for Ge channels. He has authored and co-authored more than 130 peer-reviewed papers with total SCI citation over 1450 times.

信电学院
张 睿 副教授

2. 新增科研基地和国家创新群体 | New Research Key Bases & Innovation Research Group

① **浙江省先进微纳电子器件智能系统及应用重点实验室**

实验室成立于2016年9月，李尔平教授任实验室主任，郝跃院士任实验室学术委员会主任。实验室针对浙江信息技术发展目标、国家发展战略需求，主要开展微纳电子结构及效应仿真技术，微纳电子器件设计与制造和微纳器件的智能系统集成与应用方面的研究。

Zhejiang Provincial Key Laboratory of Micro-Nanoelectronic Devices and Smart Systems

The key laboratory was established in Sept. 2016.The lab is headed by Prof. Li Erping and the Lab Academic Committee is headed by Prof. Hao Yue. The lab embarks on few key researches, namely, the modelling and simulation of micro-nano electronic structures, design and manufacturing technologies of the novel micro-nano electronic devices, integration technologies of the smart micro-nano devices and systems and their applications.

❷ 基金委创新群体：复杂石化过程建模和优化控制理论、技术及应用

该群体由控制学院苏宏业教授领衔，依托工业控制技术国家重点实验室，针对制约我国石化工业自动化发展的共性科学问题及关键技术开展研究，建立复杂石化过程建模、优化和控制相关基础理论，实现石化过程检测、运行优化与控制等核心技术的突破，主导制定先进控制与优化领域的国内外标准。

Innovative Research Group of Modeling, Optimization and Control for Complex Petrochemical Process

The research group led by Prof. Su Hongye is based on the State Key Lab of Industry Control Technology. The group has been studying systematically on the fundamental problems and key technologies in complex petrochemical processes. It proposed a series of basic theory on modeling, optimization, and control, brought forward breakthrough to the essential techniques on process detection and optimal operation, and led the development of international standards on advanced control and optimization.

3. 新增重大重点项目 | New Important Projects

❶ 多媒体分析

计算机学院吴飞教授获2016年基金委杰青项目资助，他长期从事人工智能和多媒体分析等方面的研究。本项目将重点研究数据驱动和知识指导相结合的计算模型，突破群智强化学习和跨媒体知识推理等难点问题，构建更为完善的跨媒体知识图谱，建立从浅层计算到深度挖掘、从个体智能到群体智能、从符号逻辑推理到跨媒体知识推理的模型、理论和方法。

Multimedia Analysis

The project, supported by NSFC for Distinguished Young Scholars in 2016, will make the following major scientific endeavors: finding an appropriate model to integrate data-driven machine learning algorithms with human knowledge; proposing new approaches in terms of crowd reinforcement learning and cross-media reasoning; building up cross-media knowledge graph. The research will lead to a better model for cross-media computing as follows: from shallow computation to deep mining, from individual intelligence to collective intelligence, from symbolic-logic reasoning to cross-media knowledge reasoning.
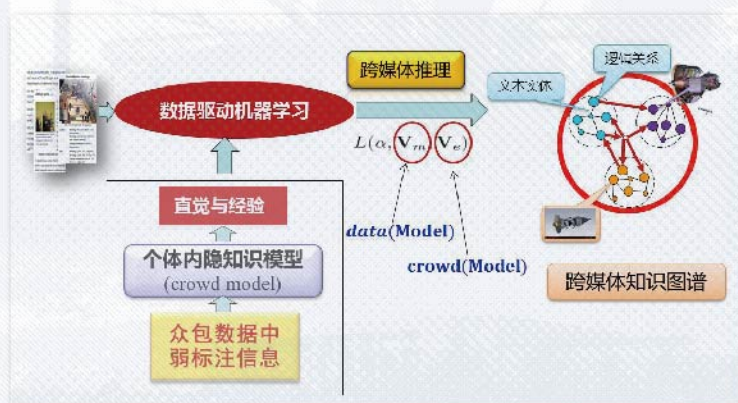
❷ 新型隐身

信电学院陈红胜教授获2016年基金委杰青项目资助。近五年来在隐身应用研究领域取得了多项原创性成果，该项目将继续瞄准电磁波隐身衣领域的关键科学问题，开展宽频隐身器件研究，有望突破隐身衣应用中的诸多技术瓶颈，加速隐身衣从原理走向应用的进程。

Novel Invisibility Cloak

The project was supported by NSFC for Distinguished Young Scholars in 2016. Several original research achievements have been made in the field of metamaterials and its applications on invisibility cloaks in recent five years. In this project, the research will be carried out on broadband invisibility cloaking to solve the key bottleneck in the electromagnetic stealth field. It is expected to promote the process of invisibility cloak from the principle to the application.
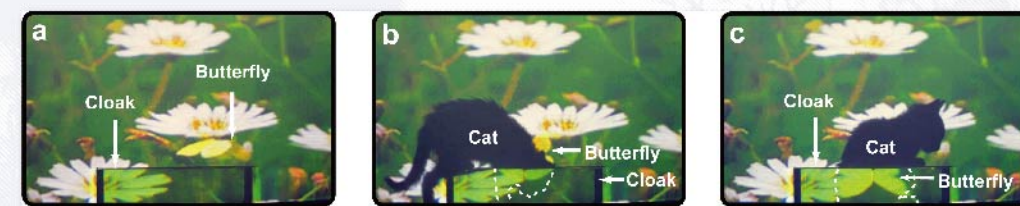
❸ 基于近场强耦合效应的新型纳米激光器研究

如何减小现有纳米激光器的结构损耗，进一步减小激光腔模尺寸、压缩线宽，是目前纳米激光器面临的关键问题。本项目提出基于近场强耦合效应的新型纳米激光器的研究设想，通过在纳米SP腔中引入近场强耦合效应，突破腔模尺寸限制，研制腔模尺寸达到单分子量级的纳米激光器。由光电学院童利民教授负责的该项目获2016年度基金委重点基金资助。

Novel Nanolasers Based on Near-field Strong Coupling Effects

How to reduce the optical loss of the lasing structure is the critical issue to be addressed for further reducing the size and linewidth of the nanolaser. In this project, we propose a novel type of nanolasers based on near-field strong coupling effects. By introducing strong coupling effects into the nanoscale SP cavity, we will overcome the limitation of the cavity size, and realize a nanolaser with cavity size down to the single-molecule level.

❹ 基于微纳时空传感与3D细胞及类器官芯片的多参数药物检测仪器

由生仪学院王平教授负责的该项目获2016年基金委重大仪器专项基金资助。项目拟通过新型微纳传感器技术、干细胞诱导分化技术、微流控技术和信息处理技术，研制基于微纳时空传感与人体器官芯片的高通量多参数药物评价仪器，探究药物筛选新方法，该方法能快速和全面反映被筛药物生物活性的综合评价。

Multiparameter Drug Detection Instrument Based on Micro/nano Space and Time Sensing and 3D Cell and Organoid Chips

Through the new micro/nano sensor technology, stem cells technology, microfluidic technology and information processing technology, high-throughput and multi-parameters drug evaluation instrument based on the development of micro nano sensing time and human organ chip will be researched, as well as a new method of screening the drug, which can reflect the comprehensive evaluation rapidly and fully.

⑤ 基于散射光电磁场分布逆向识别数据库的高次曲面表面缺陷定量检测仪

由光电学院杨甬英教授负责的该项目获2016年基金委重大仪器专项基金资助。缺陷检测涉及"宏观表面微观检测对象"的"极限尺寸检测"问题，以及缺陷高分辨率三维形貌检测科学难题，该项目将解决上述难题并填补该领域内的国际空白。利用模拟缺陷实际成像环境的理论仿真模型，建立基于FDTD的表面微观缺陷散射光场分布的多维特征决策模型逆向识别数据库及检测设备，研究二维子孔径图像的三维映射重建及基于投影变换的全口径图像拼接。

High Order Surface Defect Quantitative Detecting Instrument Based on Reverse Recognition Database of Scatter-light Electromagnetic Field Distribution

With the help of theoretical simulation model which can simulate the actual imaging environment of defects, the reverse recognition database of defect scatter-light field distribution based on FDTD simulation will be established and the reverse recognition inspection of defects will be achieved by the library of multi-dimensional feature decision models. The 3D reconstruction of 2D subapertures and full-aperture stitching based on projection transformation will be studied.

⑥ 脑神经网络复杂系统的实时解析与调控仪器研制

由生仪学院陈耀武教授负责的该项目获2016年基金委重大仪器专项基金资助。项目拟研究高通量脑神经信号实时同步采集与在线锋电位分类技术和基于高性能嵌入式GPU处理器的脑神经网络实时解析与精准调控技术，构建图形化和组件化的仪器管理分析系统，突破大脑内复杂神经网络的动态连接研究中遇到的技术瓶颈。本项目将填补我国在脑神经信号记录与调控仪器设备方面的空白。

Research and Development of Real-time Analyzing and Modulating Instrument for Complex Brain Neural Network

The project aims to develop a real-time analyzing and modulation system for neural network. The tasks will be accomplished including real-time high-throughput neural data acquisition and analysis technology for multimodal signals, GPU-based high-throughput data real-time processing and modulation technology, modular and reconfigurable system with graphical programming software. It overcomes technical bottlenecks encountered in studying dynamic connectivity of complex neural circuits.
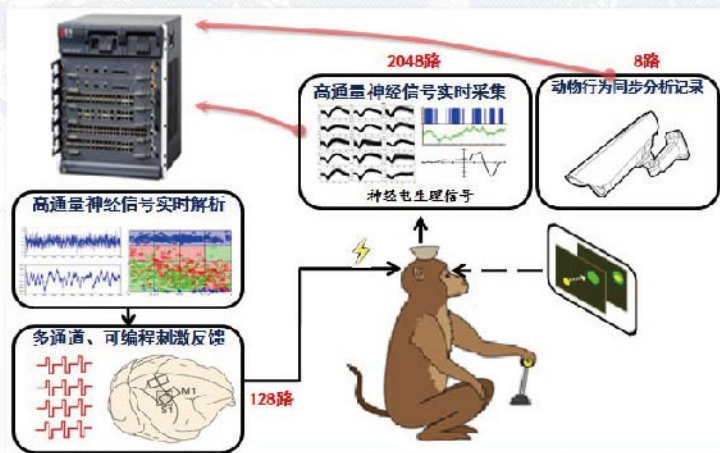
⑦ 全断面大型掘进装备集成控制与优化运行理论及应用

由控制学院毛维杰教授负责的该项目获2016年基金委重点基金资助。项目以机理分析、应用研究和工程验证为主线，深入分析机电液多系统间的耦合规律，建立掘进装备闭链结构约束下多系统耦合模型；研究掘进装备的纠偏轨迹在线规划与基于推进系统多分区协调的轨迹纠偏控制；研究面向掘进面稳定的掘进过程多系统协调控制；研究基于大数据的掘进过程地质适应性优化运行方法。

Integrated Control and Optimization of Large-scale Full-face Tunneling Equipment with Applications

The project firstly aims at constructing a multi-system coupling model under closed chain structure constraints. Then, the position and posture rectification tracking trajectory planning and trajectory tracking control based on thrust system multiple partition will be researched. In order to deal with the strong pressure fluctuation, a multi-system coordination control method will be studied. Furthermore, geological adaptive optimal operation method based on big data will be carried out to make tunneling parameters match with geological condition in a timely manner.
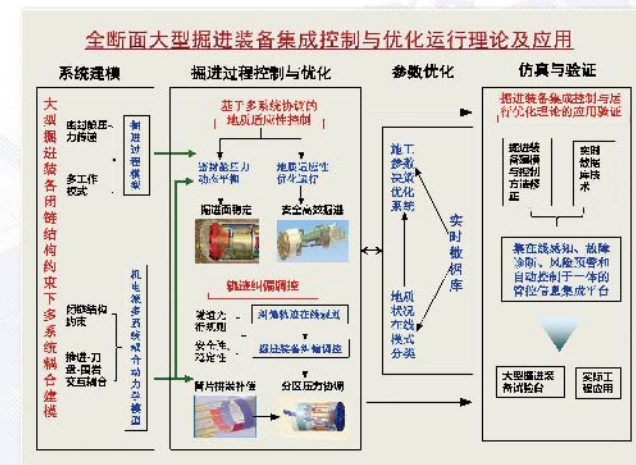
⑧ 内生安全的主动防御工控系统防护技术研究

本千万级项目负责人是控制学院王文海教授。拟通过融合信息物理系统特征，创新工控系统动态重构与可信增强技术，构建多层次多维度深度防御体系，实现内生安全的主动防御。主动防御内生安全的核心技术体系全面保障ICS的安全性、可靠性、实时性、可用性，形成ICS深度安全防护整体解决方案。

Research on the Protection Technology of Industrial Control System for Endogenous Security Active Defense

The project builds a multi-level and multi-dimensional depth defense system to realize active defense of endogenous safety by integrating information physical system features, innovating ICS dynamic reconfiguration and trusted enhancement technology. Active protection of endogenous safety of the core technology system to fully protect ICS security, reliability, real-time, availability，the formation of ICS deep security protection overall solution.
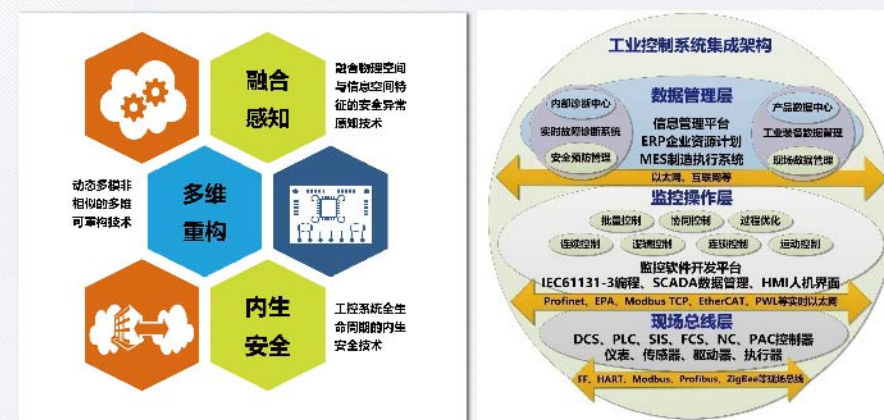
⑨ 海洋声学层析成像理论、技术与应用示范

该千万级项目负责人是信电学院赵航芳教授。拟研究大范围大深度声学层析、高分辨海底地貌成像、声场-动力数据耦合同化、PIES 阵列海洋动力环境参数反演、高精度声学传播模型与声场预报、中尺度过程检测等理论、方法与技术。通过测量节点研制、集成深海声学层析系统和声成像系统，研发数据管理和层析成像可视化系统，开展深海声学层析观测示范试验和声成像试验，为水下目标探测和中尺度过程检测提供技术手段和数据服务。

The Theory, Techniques and Applied Demonstration of Acoustic Tomography and Imaging in Ocean

Within the framework of inverse-problem inference of acoustic remote sensing in sea, we mainly research on theories, methods and techniques of acoustic tomography in large scale and deep depth, high-resolution acoustic imaging for large range of bottom topography, assimilation of sound filed and oceanic dynamics, ocean environment inversion using PIES array, high precision acoustic propagation models and acoustic field prediction, and mesoscale process detection.
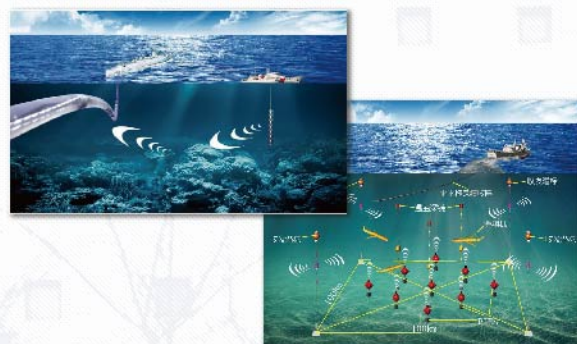
⑩ 自动化集装箱码头水平运输控制系统

在自动化码头的整个系统中，由AGV组成（借以取代传统的由司机驾驶的卡车）的水平运输控制系统是最核心的系统、也是技术难度最高的部分。本项目研发的系统能高效响应上层指令且能处理的AGV台数在理论上没有限制。系统已经实现了AGV的动态最优路径规划、实时避碰、自动避障、自动检测和预防死锁及自动解锁等功能，得到了业主和国际同行的高度评价。该千万级项目由控制学院吴维敏教授负责。

The Horizontal Transport Control System of Automated Container Terminal

The horizontal transport control system consisting of AGVs (automatic guided vehicle) is the most important and difficult part of the entire ACT system. The system is able to execute orders efficiently and handle unlimited AGVs in theory. It is also able to plan optimized routes for AGVs, avoid collision in real time, automatically avoid obstacles, automatically detect, prevent and unlock deadlock and so on. The system has earned high praise from the sponsor and the international peers.

⑪ 基于大数据等先进技术的网上支付及金融服务的关键技术研发

计算机学院和连连银通电子支付有限公司合作成立"浙江大学-连连支付软件技术联合研发中心"，主要围绕连连银通所从事的移动支付、跨境支付实践和我国互联网金融领域所面对的关键技术问题进行研究，拟在大数据的深度挖掘与分析、网上支付与金融服务、区块链技术的应用、实时交易平台等方面进行深入合作，有望在技术创新上获得突破。

R&D of Key Technologies in Web Payment and Financial Services Based on Big Data Technologies

College of CS and Lianlian Pay Co., Ltd. jointly founded the research center mainly to study the major technical problems in the Lianlian Pay's mobile payment and cross-border payment, and in the field of Internet finance in China. Extensive collaborations in big data analysis, web payment and financial services, block-chain applications and real-time trading platforms will be developed based on the integration of production, education and scientific research.

4.重大科研成果及进展 | Research Achievements and Significant Progress

❶ 高安全成套专用控制装置及系统

项目获2016年国家科技进步二等奖，负责人是控制学院王文海教授。项目先后解决了硬件系统技术、软件系统技术和工程系统技术三大系统性核心技术，成功研制出保障控制系统全生命周期安全稳定运行的高安全成套专用控制装置及系统。成果在汽轮机、电梯、环保等领域关键工业装备推广应用13000余套，产品出口美、日、俄等32个国家。获授权发明专利104项。近三年新增销售额111.15亿元。

High Safety Customized Control System

The research group has solved the three core technologies of hardware system, software system and engineering, and made significant innovations to establish successfully the high safety customized control system for ensuring the safe and stable operation of the whole life cycle of the control system.The project achievements have successfully applied to more than 13000 units in steam turbine, elevator, environmental protection and other key industrial equipments. The products have been exported to USA, Japan, Russia and other 32 countries. Sales of 11.115 billion yuan in nearly three years were created.

❷ 海量混合时态数据融合处理关键技术及应用

项目获2016年教育部高等学校科技进步一等奖，负责人是计算机学院陈刚教授。项目为大数据批流协同融合处理提出了对应用透明的系统级解决方案，解决了在大数据集上进行低迟滞高实时 Ad Hoc 查询的科学问题，获得发明专利12项，发表论文32篇，获得VLDB 2014最佳论文奖。成果在金融、互联网等领域得到广泛应用，完成单位在近三年应用项目成功新增销售额39.3亿元，新增利润21.7亿元。
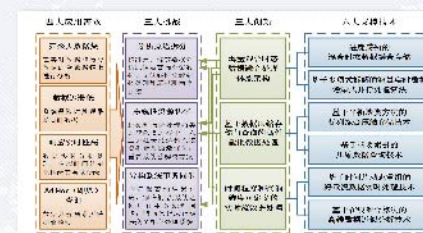
Hybrid Temporal Processing Techniques and Applications for Big Data

The project proposes an application-transparent solution for merging batch and streaming processing. It addresses the challenges of supporting low-latency real-time ad-hoc query processing on large-scale datasets. The project has applied for 12 patents, published 32 papers with one VLDB 2014 best paper award. The corresponding technologies have been applied in finance, internet and other industries. In nearly three years Sales of 3.93 billion yuan were created.

❸ 纳米光源照明开创新型大视场无标记纳米显微成像新技术

光电学院杨青、刘旭教授团队利用微纳光源照明突破无标记远场超分辨显微瓶颈，且成像视场达数千平方微米，相比其它无标记远场超分辨成像方法提升1数量级以上。有关成果发表在Phys. Rev. Lett.上。该方法可方便地与传统显微镜集成，在生物医学、集成芯片和纳米材料等领域具有重要的应用前景。

Active Fluorescent Nanowire Enables Far-field and Wide-field Nanoscale Visualization

The research group demonstrates a novel active nanoscopy based on the nanoscale light source and breaks the bottleneck in wide-field, far-field, label-free subdiffraction imaging successfully. The field of view is one order of magnitude improved from the previously reported far-field and full-field method. This work is significant for physics, materials and biology etc. that need nanoscale visualization.
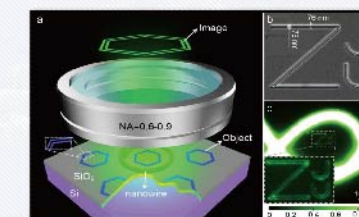
④ 新一代高效视频编码国家标准AVS2

信电学院虞露教授团队引领AVS标准工作组会员单位，四年多历经22次会议600余份技术提案，最终形成了AVS2视频编码标准，编码效率比上一代标准提高一倍以上，并超越最新国际标准HEVC（H.265）。其中浙大团队占该标准采纳提案的21%，为该项标准做出了突出贡献。2016年12月正式颁布为国家标准《GB/T 33475.2信息技术 高效多媒体编码》。目前央视正在布署基于AVS2的4K电视广播，将于2018年开始运营。

Important Improvement in High Efficiency Video Coding

This group leaded development of AVS2 video coding standard which was finally achieved by 22 standardization meetings, over 600 competitive technical proposals in more than four years. 21% accepted proposals came from ZJU. Coding efficiency of AVS2 is doubled compare to AVS1, and it outperforms the latest international video coding standard HEVC/H.265. AVS2 was published as the national standard in Dec. 2016. Currently, China Central Television is deploying broadcasting of 4K Ultra High Definition Television based on AVS2.

⑤ 语音与音乐的节奏特征
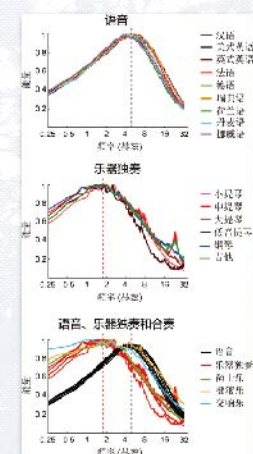
音乐和语音都是有组织、有节奏的复杂声音。生仪学院丁鼐研究员团队研究发现，汉语、英语、法语等9种语言的语音具有极其相似的声学节奏，这种节奏的共振频率在5赫兹左右。另一方面，西方古典音乐的乐器独奏以及爵士乐、摇滚乐和交响乐也具有相似的声学节奏，不过其共振频率在2赫兹以下。该研究为语音和音乐的跨文化比较提供了新的思路。

Acoustic rhythms in speech and music

Speech and music have structured rhythms. We characterized spoken and musical rhythms using the modulation spectrum. The speech modulation spectrum is highly consistent across languages. A different, but similarly consistent modulation spectrum is seen for Western music. Peaks in the speech and music modulation spectra are well separated, reflecting distinct time scales in speech and music rhythms.

5．年度代表性论文| Recommended Papers

① On-chip Coherent Conversion of Photonic Quantum Entanglement between Different Degrees of Freedom

作者：Feng, Lan-Tian; Zhang, Ming; Zhou, Zhi-Yuan; 等.
来源：NATURE COMMUNICATIONS　卷: 7　文献号: 11985　出版年: July.2016

We demonstrate the coherent conversion of photonic quantum signals between different degrees of freedom on a single chip for the first time. By using mode multiplexers/converters, single photons in different paths or polarizations can be converted to/back to different guided-modes in a multi-mode waveguide. It enables the control and conversion of multiple degrees of freedom of photons for future quantum information process.
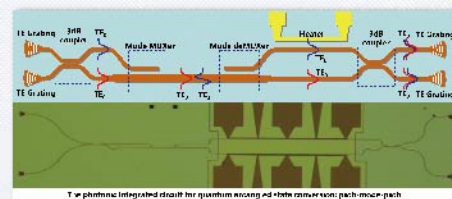
② Invisible Metallic Mesh

作者：Ye, Dexin; Lu, Ling; Joannopoulos, John D; 等.
来源：PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA
卷: 113　期: 10　页: 2568-2572　出版年: MAR 8 2016

We introduce non-scattering corrugated metallic wires to construct such a medium. Analytical solutions, full-wave simulations and microwave measurement results on 3D printed samples show omnidirectional invisibility in any configuration. This invisible metallic mesh can improve mechanical stability and electrical conduction of a system, without disturbing the electromagnetic design.
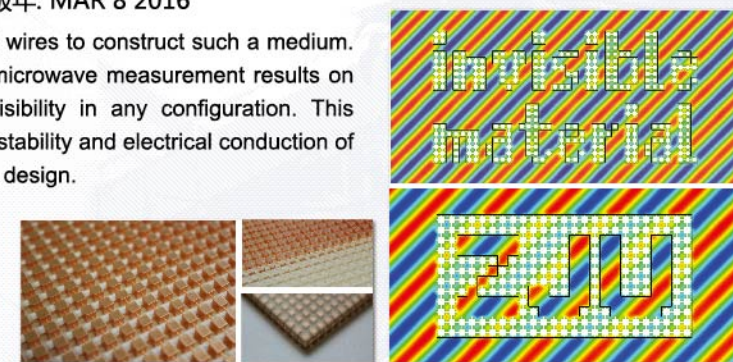
③ Virtual K-space Modulation Optical Microscopy

作者：Kuang, Cuifang; Ma, Ye; Zhou, Renjie; 等.
来源：PHYSICAL REVIEW LETTERS　卷: 117　期: 2　页: 028102　出版年: JUL 6 2016
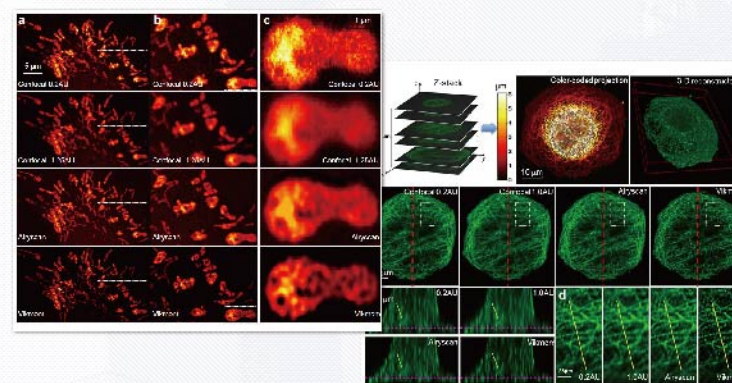
We report a novel super-resolution microscopy approach for imaging fluorescence samples. The approach, termed *virtual k-space modulation optical microscopy (Vikmom)*, is able to improve the lateral resolution by a factor of two, reduce the background level, improve the optical sectioning effect and correct for unknown optical aberrations. We demonstrated the performance of Vikmom by imaging fluorescent beads, fixed bovine pulmonary artery endothelial (BPAE) cells and living human astrocytes (HA).

④ Single CdTe Nanowire Optical Correlator for Femtojoule Pulses

作者：Xin, Chenguang; Yu, Shaoliang; Bao, Qingyang; 等.
来源：NANO LETTERS　卷: 16　期: 8　页: 4807-4810
出版年: Aug.2016

We demonstrate a single nanowire optical correlator. Pulses to be measured were equally split and coupled into two ends of a suspending nanowire via tapered optical fibers. By transferring the spatial intensity profile of the TSH image into the time-domain temporal profile of the input pulses, we operate the nanowire as a miniaturized optical correlator with input energy goes down to 2 fJ/pulse for 1064 nm 200 fs pulses.
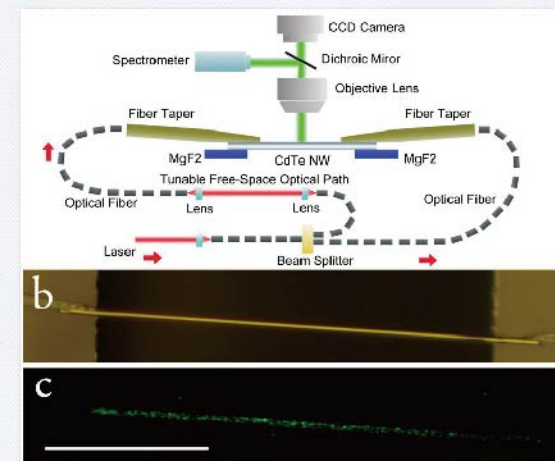
⑤ Concealing Arbitrary Objects Remotely with Multi-folded Transformation Optics
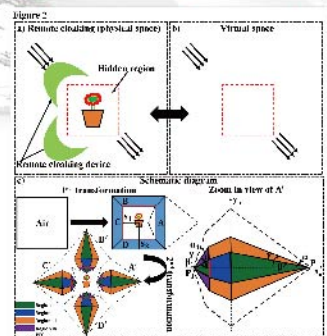
作者：Zheng, Bin; Madni, Hamza Ahmad; Hao, Ran; 等.
来源：LIGHT: SCIENCE & APPLICATIONS 卷: 5 文献号: e16177 出版年: DEC 2016

This paper has proposed a novel method to design a remote cloaking device that makes any object located at a certain distance invisible. This is accomplished using multi-folded transformation optics to remotely generate a hidden region around the object that no field can penetrate and that does not disturb the far-field scattering electromagnetic field. As a result, any object in the hidden region can stay in position or move freely within that region and remain invisible.

⑥ A-Optimal Projection for Image Representation

作者：作者: He, Xiaofei; Zhang, Chiyuan; Zhang, Lijun; 等.
来源：IEEE TRANSACTIONS ON PATTERN ANALYSIS AND MACHINE INTELLIGENCE 卷: 38 期: 5
页: 1009-1015 出版年: MAY 2016

We consider the problem of image representation from the perspective of statistical design. Unlike traditional approaches, we propose a novel dimensionality reduction algorithm called A-Optimal Projection (AOP) which is based on a linear regression model. Specifically, AOP finds the optimal basis functions so that the expected prediction error of the regression model can be minimized if the new representations are used for training the model. Experimental results suggest that the proposed approach provides a better representation and achieves higher accuracy in image retrieval.
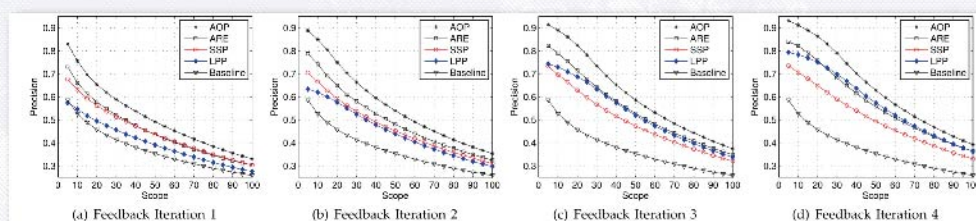
Fig. 1. The average *precision-scope* curves of different algorithms for the first four feedback iterations. The AOP algorithm performs the best on the entire scope.

### ⑦ Data Gathering Optimization by Dynamic Sensing and Routing in Rechargeable Sensor Networks

作者：Zhang, Yongmin; He, Shibo; Chen, Jiming
来源：IEEE-ACM TRANSACTIONS ON NETWORKING 卷: 24 期: 3 页: 1632-1646 出版年: JUN 2016

This paper designs a dynamic sensing and routing (DoSR) algorithm to optimize the data gathering performance in rechargeable sensor networks. In specific, a balanced energy allocation scheme (BEAS) is first designed for each sensor to manage its energy use, which is proven to meet four practical requirements. Then, a distributed sensing rate and routing control (DSR2C) algorithm is proposed to optimize data sensing and data transmission, while guaranteeing network fairness. Simulation results demonstrate the efficiency of the proposed algorithms.
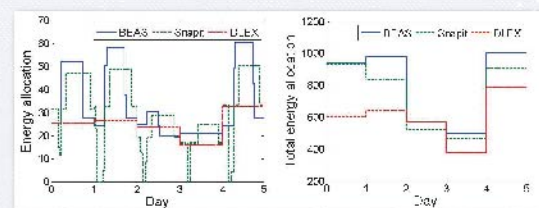
⑧ Impedance Spectroscopy Analysis of Human Odorant Binding Proteins Immobilized on Nanopore Arrays for Biochemical Detection
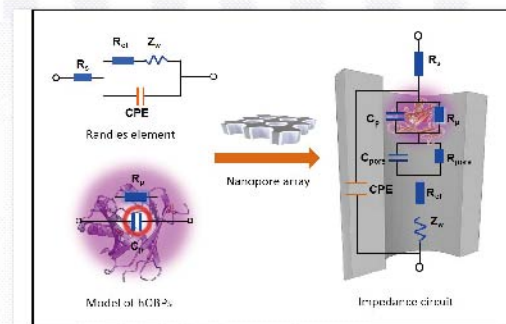
作者：Lu, Yanli; Zhang, Diming; Zhang, Qian; 等.
来源：BIOSENSORS & BIOELECTRONICS 卷: 79 页: 251-257
出版年: MAY 15 2016

With highly ordered nanopore arrays, an electrochemical biosensor was established to interpret interactions between hOBPs and different ligands, such as disease related aldehydes and fatty acids. As a sensitive and specific method to detect different biomolecule components, this impedance biosensor showed promising potentials in odorant sensing, human olfaction investigation, biochemical detection, and disease diagnostics.

⑨ A 3D Feature Descriptor Recovered from a Single 2D Palmprint Image

作者：Zheng, Qian; Kumar, Ajay; Pan, Gang
来源：IEEE TRANSACTIONS ON PATTERN ANALYSIS AND MACHINE INTELLIGENCE 卷: 38 期: 6
页: 1272-1279 出版年: JUN 2016

This paper proposes a new feature descriptor for the 2D palmprint matching. The descriptor is extracted for each point on the palmprint, based on the ordinal measure which partially describes the difference of the neighboring points' normal vectors. We show that such 3D information can be extracted from a single 2D palmprint image. Four publicly available 2D palmprint databases are evaluated for both identification and verification
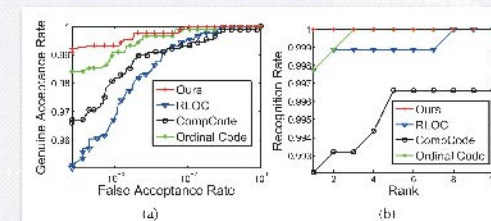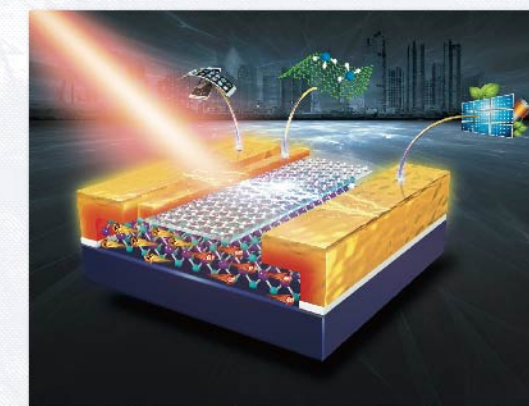
Fig. 7. (a) The ROC curves and (b) CMC curves of different methods from the PolyU 2D/3D contactless palmprint database.

Fig. 4. The feature code of palmprint. (a) Original gray level image. (b) The feature code.

⑩ Contacts between Two- and Three- Dimensional Materials: Ohmic, Schottky, and p-n Heterojunctions

作者：Xu, Yang; Cheng, Cheng; Du, Sichao; 等.
来源：ACS NANO 卷: 10 期: 5 页: 4895-4919
出版年: MAY 2016

The field of 2D electronics has reached a stage with booming materials and device architectures, however, the efficient integration of 2D functional layers with 3D systems remains a significant challenge. In this work, we investigate the experimental efforts in interfacing 2D layers with 3D materials and analyze the properties of the heterojunctions formed between them. For each type of the hetero junctions, the potential applications are also discussed.

11 A Split-Reduced Successive Cancellation List Decoder for Polar Codes

作者：Zhang, Zhaoyang; Zhang, Liang; Wang, Xianbin; 等.
来源：IEEE JOURNAL ON SELECTED AREAS IN COMMUNICATIONS 卷: 34 期: 2 页: 292-302
出版年: FEB 2016

We observe for the first time that, in list decoding of Polar codes, a correct path will not split with high probability while an incorrect path will split almost surely in the subsequent decoding. Then a new splitting rule is proposed, which significantly reduces the unnecessary splits. Moreover, under this rule the decoding paths will merge to a single one with probability 1 at a certain position without performance loss. In this way, the overall decoding complexity and latency can be reduced by as much as 80% in typical cases.
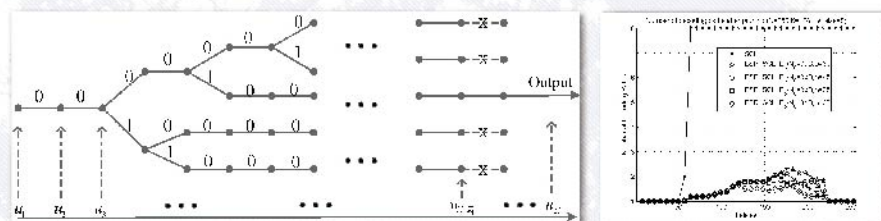
12 Online Metric-Weighted Linear Representations for Robust Visual Tracking

作者：Li, Xi; Shen, Chunhua; Dick, Anthony; 等.
来源：IEEE TRANSACTIONS ON PATTERN ANALYSIS AND MACHINE INTELLIGENCE 卷: 38 期: 5
页: 931-950 出版年: MAY 2016

We propose a visual tracker based on a metric-weighted linear representation of appearance. To capture the interdependence of different feature dimensions, we develop two online distance metric learning methods using proximity comparison information and structured output learning. The learned metric is then incorporated into a linear representation of appearance. We design a time-weighted reservoir sampling method. We demonstrate the effectiveness of the method for both inter-frame tracking and object identification.
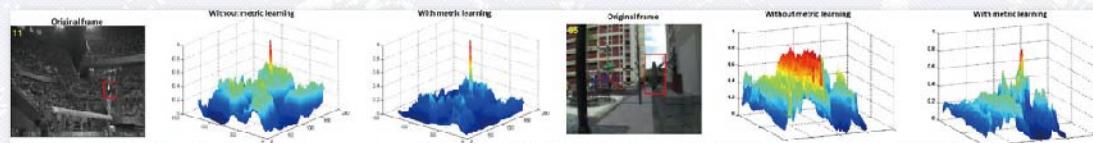
13 The Box-Jenkins Steiglitz-McBride algorithm

作者：Zhu, Yucai; Hjalmarsson, Hakan
来源：AUTOMATICA 卷: 65 页: 170-182 出版年: MAR 2016

An algorithm for identification of single-input single-output Box–Jenkins models is presented. Firstly a high order ARX model is estimated; secondly, the input–output data is filtered with the inverse of the estimated disturbance model; thirdly, the filtered data is used in the Steiglitz-McBride method to recover the system dynamics; finally, the noise model is recovered by estimating an ARMA model from the residuals of the third step. A Monte Carlo simulation study with an oscillatory system is presented and these results are complemented with an industrial case study.
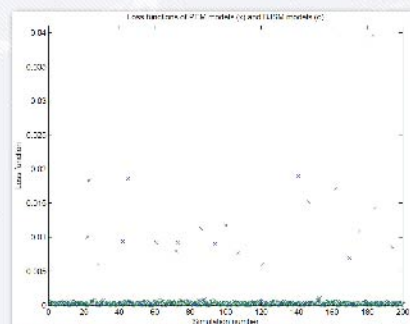
14 Optimal Estimation in UDP-Like Networked Control Systems with Intermittent Inputs: Stability Analysis and Suboptimal Filter Design

作者：Lin, Hong; Su, Hongye; Shu, Zhan; 等.
来源：IEEE TRANSACTIONS ON AUTOMATIC CONTROL 卷: 61 期: 7 页: 1794-1809 出版年: JUL 2016

This paper investigates the optimal estimation problem in lossy networked control systems where the control packets are randomly dropped without acknowledgment. The system state follows a Gaussian mixture distribution with exponentially increasing terms. It is revealed that the stability is independent of the packet loss rate, and is not affected by the lack of acknowledgment. A suboptimal filter with improved computational efficiency is then developed.
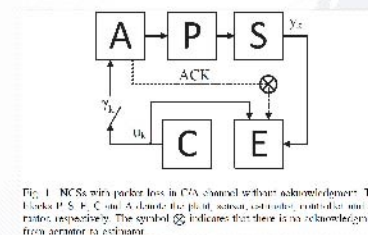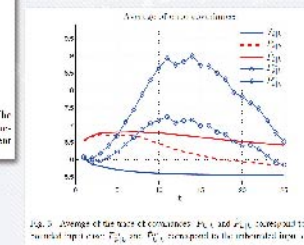
15 Adaptive Matrix Column Sampling and Completion for Rendering Participating Media

作者：Huo, Yuchi; Wang, Rui; Hu, Tianlei; 等.
来源：ACM TRANSACTIONS ON GRAPHICS 卷: 35 期: 6 文献号: 167 出版年: NOV 2016

We present a novel sparse sampling and reconstruction method for many-light rendering of participating media. We formulate the gathering of many lights as a matrix problem, and propose an adaptive matrix column sampling and completion algorithm to efficiently reconstruct the matrix by only sampling a small number of elements. Our approach greatly improves the performance, and obtains up to one order of magnitude speedup comparing to the state-of-the-art work.

16 A Novel Sensitive Cell-Based Love Wave Biosensor for Marine Toxin Detection

作者：Zhang, Xi; Fang, Jiaru; Zou, Ling; 等.
来源：BIOSENSORS & BIOELECTRONICS 卷: 77 页: 573-579 出版年: MAR 15 2016

A novel HepG2 cell-based biosensor using Love Wave Sensor was developed to implement the real-time and sensitive detection of a diarrheic shellfish poisoning (DSP) toxin, Okadaic acid (OA). Results showed this sensor could monitor the cell attachment process in real time and response signals were related to the initial cell seeding densities. Furthermore, cell-based Love Wave Sensor was treated with OA toxin. This biosensor presented a good performance to various OA concentrations, with a wide linear detection range (10–100 μg/L) and it will be a promising tool for real-time and convenient OA screening.
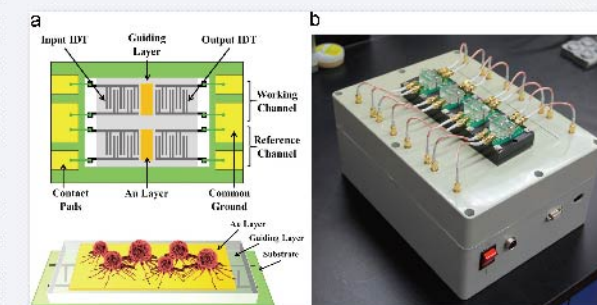
人才培养

Education

学部共有12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）6361人，在国内外各类学科竞赛中成绩优异，本科生深造率达60%。

There are totally 12 undergraduate programs, 8 doctorate programs of primary discipline, 1 master program of primary discipline, 21 doctorate programs and 22 master programs of secondary discipline. About 6361 full-time undergraduate and graduate students enrolled in the faculty. They have made outstanding achievement in various international and domestic disciplinary competitions. Almost 60% undergraduate students can continue their studies at home or aboard.

本科专业 UG Programs

学 院 College of	本科专业 UG Program
光电科学与工程学院 Optical Science and Engineering	光电信息科学与工程 Optoelectronic Information Science and Engineering
信息与电子工程学院 Information Science and Electronic Engineering	信息工程 Information Engineering
	电子科学与技术 Electronic Science and Technology
	微电子科学与工程 Microelectronic Science and Engineering
控制科学与工程学院 Control Science and Engineering	自动化 Automation
计算机科学与技术学院 Computer Science and Technology 软件学院 Software Technology	计算机科学与技术 Computer Science and Technology
	数字媒体技术 Digital Media Technology
	软件工程 Software Engineering
	工业设计 Industrial Design
生物医学工程与仪器科学学院 Biomedical Engineering & Instrument Science	产品设计 Product Design
	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
信息传感及仪器 Information Sensing and Instruments

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

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
电子信息技术及仪器 Electronic Information Technologies and Instruments

网络空间安全 Cyberspace Security

设计学* Design*
设计艺术学* Art of Design*

*只有硕士点
*Only master program

学生（人） Students

学生 Students	学院 College	光电科学与工程学院 COSE	信息与电子工程学院 ISEE	控制科学与工程学院 CSE	计算机科学与技术学院 CCST	软件学院 CST	生物医学工程与仪器科学学院 BME	合计 Total
在校生 Enrollments	博士生 Doctor	241	237	217	468	/	189	1352
	硕士生（全日制）Master	322	451	403	932	440	278	2826
	本科生（13级、14级）Undergraduate	254	579	235	816	/	299	2183
招生数 Freshmen	博士生 Doctor	52	53	43	80	/	44	272
	硕士生（全日制）Master	105	166	128	306	200	92	997
	本科生（15级）Sophomore	121	289	119	410	/	139	1078
毕业生 Graduates	博士生 Doctor	48	33	26	56	/	22	185
	硕士生（全日制）Master	95	130	114	296	183	88	906
	本科生 Undergraduate	117	278	122	402	/	162	1081
本科生深造与对外交流 Further Study and International Exchange of Undergraduate	毕业生* Graduate*	117	276	122	367	/	144	1026
	出国深造率 Ratio of Further Studies Aboard	32.48%	12.32%	36.88%	31.34%	/	20.53%	25.50%
	读研率 Ratio of Further Study at Home	39.32%	36.96%	45.9%	26.98%	/	32.45%	34.09%
	对外交流人次 International Exchange	51	73	42	116	/	29	311

*不包括竺可桢学院学生
*Except the students belong to Chu Kochen Honors College

国际学科竞赛 International Disciplinary Competitions

竞赛名称 Competition	奖项 Award	获奖人员（及作品）Winners List	指导教师 Advisors
2016红点国际设计奖 Reddot Award 2016	优胜奖 Winner	Emo Gloves：张小恋，李 冰，李佳济	姚 玲 Yao Cheng
2016 iF国际学生设计奖 iF Student Design Award 2016	优胜奖 Winner	Silent Angel：李 冰，张小恋，刘尊佳	应放天 Ying Fangtian
2016台湾国际学生创意设计大赛 Taiwan International Student Design Competition	特别奖 International Design Association Special Prize JDP Special Award	Open Gloves：张小恋，李 冰	姚 玲 Yao Cheng
	最终奖 Finalist	Cleansmile：张小恋，李 冰	
2016世界机器人大赛 The 20th Robot World Cup (RoboCup 2016)	小仿人组亚军 Kid-Size Humanoid League 2nd place	尹 欢 梅文星 周海燕 余冬冬 黄浩钧 留 云 彭 勃 姜朝峰 郑博夫	熊 蓉 周春琳 Xiong Rong, Zhou Chunlin
	小型组季军 Small Size League 3rd place	陈凌云 胡伟健 李雅纯 余 楠 唐文剑 王 儒 黄哲远 吴亚楠 高天尧 方泽华	
2016国际机器人创意设计大赛 IDC Robocon 2016	第三名 3rd place	陶江鹏	王 西 朱秋国 Wang You, Zhu Qiuguo
	最佳创意奖 Best Creative Award	袁培正	
2016年世界机器人大赛 伊朗公开赛 2016 RoboCup Iran Open	小型组季军 Small Size League 3rd place	金礼森 陈凌云 胡伟健 陈笑行 李雅纯 余 楠 黄哲远 洪晨光 高天尧 方泽华	熊 蓉 Xiong Rong
2016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（7块）Gold Medalist in Asia Regional Contest	Siunaus：王夏君 赵越奇 金梦格 ; TaZoF：翁才智 周佳瑜 范浩正 ; Dominoes：杨欣豫 冼伟钊 陈诗翰 ; voidMian：姜成全 张瑜安 魏天昊	王 灿 Wang Can
	亚洲赛区银牌（6块）Silver Medalist in Asia Regional Contest	Dominoes：杨欣豫 冼伟钊 陈诗翰 ; rkmxtxwd：华铱炜 蔡嘉楠 王禹程 ; voidMian：姜成全 张瑜安 魏天昊	
2016年国际空中机器人大赛（亚太赛区）2016 International Aerial Robotics Competition (Asia and Pacific Venue)	一等奖 the First Prize	ZMART：王宏达、翁一桢、叶 波、茹祥宇、朱 均、万旭东、朱疆成、崔 粲、邱 炜、郭 磊	许 超 张 宇 Xu Chao, Zhang Yu

国内学科竞赛 Civil Disciplinary Competitions

竞赛名称 Competition	奖项 Award	获奖人员（及作品） Winners List	指导教师 Advisors
2016RoboCup机器人 世界杯中国赛 2016 RoboCup China Open	小仿人组一等奖 Kid-Size Humanoid League 1st place	黄浩钧 余冬冬 周海燕 梅文星 舒 展 留 云 黄政明 李炜铭 王嘉奇 杨宇杰 王步霖 尹 欢 潘雨粟 姜朝峰 彭 勃	熊 蓉 Xiong Rong
2016年中国大学生程序设计竞赛 China Collegiate Programming Contest (CCPC)	金牌（3块） Gold Medal	Siunaus：王夏君 赵越奇 金梦格 TaZoF：翁才智 周佳瑜 范浩正	王 灿 Wang Can
第五届全国大学生光电设计竞赛 The 5th National University Students' Opt-Sci-Tech Competition	一等奖（3） 1st place	WALL-E：李艳宾 冯逸鹤 叶鸿凯	汪凯巍 闻春敖等 Wang Kaiwei, Wen Chunao, etc.
		光电三杰：龚启航 吕国冕 董 月	匡翠方 汪凯巍等 Kuang Cuifang, Wang Kaiwei, etc.
		每天提高一个线队：李维嘉 张智敏 赫贵然	
	二等奖（1） 2nd place	老飞机：杨 喜 胡鑫欣 陈 典	汪凯巍 闻春敖等 Wang Kaiwei, Wen Chunao, etc.
2016年第九届全国大学生 信息安全竞赛 2016 National College Student Information Security Contest	二等奖（3） 2nd place	姜墨泉、吕浩钧、邱逸飞、刘宇辰	张 昱 金心宇 Zhang Yu , Jin Xinyu
		李卓远、刘耕铭、徐 亮、陈昱彤、 赵宸泽、陈建瑜、谢俊东、缪 征、 樊浩然、李陈浩文	张 昱 金心宇 Zhang Yu , Jin Xinyu
		楼潇轩、张启明、吴武超	张 帆 金心宇 Zhang Fan , Jin Xinyu
全国高校网络安全联赛 （X-NUCA）2016赛季总决赛 National University Cybersecurity Association- 2016 Finals	二等奖 2nd Place	李卓远、朱梦凡、诸嘉琦、陈建瑜	张 昱 金心宇 Zhang Yu , Jin Xinyu

教学成果奖 Teaching Achievement Awards

奖项 Award	等级 Class	成果名称 Projects	负责人 Leaders
浙江省高等教育教学成果奖 Zhejiang Provincial Teaching Achievement Awards	一等奖 1st place	程序设计类在线课程建设及实践教学资源 共建共享模式探索	陈越等 Chen Yue, etc.
		基于软硬件课程贯通和分级分层次的系统 能力培养创新体系构建	陈文智等 Chen Wenzhi, etc
	二等奖 2nd place	以知行合一、学养兼修为导向的自动化 专业人才培养体系的探索和实践	张光新等 Zhang Guangxin, etc.
		面向电子信息技术高度融合发展新常态的 本科专业课程体系建设	章献民等 Zhang Xianmin, etc.

专项奖 Special Awards

奖项 Award	获奖学生 Winners	学院 College of
2015-2016学年浙江大学 竺可桢奖学金（研究生） Chu Kochen Scholarship (Graduate Student)	陈琪美 Chen Qimei	信息与电子工程学院 Information Science and Electronic Engineering
	张倬钒 Zhang Zhuofan	信息与电子工程学院 Information Science and Electronic Engineering
2015-2016学年浙江大学 竺可桢奖学金（本科生） Chu Kochen Scholarship (Undergraduate)	黄玉佳 Huang Yujia	光电科学与工程学院 Optical Science and Engineering
	张国栋 Zhang Guodong	信息与电子工程学院 Information Science and Electronic Engineering
	杨竣淋 Yang Junlin	控制科学与工程学院 Control Science and Engineering
	李博涵 Li Bohan	计算机科学与技术学院 Computer Science and Technology

海外交流
International Exchange and Cooperation

学部2016年教师出访参加学术会议、合作交流434人次，接待218人次国外学者来访进行学术交流，主办国际会议10次，接待新加坡科技设计大学、墨尔本大学工学院和日本早稻田大学等来访。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。

In the past year, 434 persons visited abroad for academic exchange and cooperation. More than 218 world-renowned scholars were invited to visit FIT. Meanwhile, we successfully hosted about 10 international conferences and welcomed the delegations from Singapore University of Technology and Design, University of Melbourne and Waseda University. The colleges of FIT continue to strengthen the international exchange and cooperation in order to further enhance the level of teaching and scientific research.

主办国际会议 Host International Conferences

序号 No.	会议名称 Conference	时间 Date
1	亚洲工学院院长峰会 Asian Engineering Deans' Summit, AEDS	May 16-17
2	第7届亚太国际电磁兼容大会 Asia-Pacific International Symposium on Electromagnetic Compatibility & Signal Integrity and Technical Exhibition	May 18-21
3	国际电磁兼容研究及应用中的挑战和机遇研讨会 International Workshop on EMC Research and Application: Challenges and Opportunities	May 23
4	国际固态电路会议 International Solid-State Circuits Conference	July 4
5	"海上丝绸之路"沿线国家传统药物研讨会 The Symposium of Traditional Medicine in Countries along 'Maritime Silk Route'	August 5-6
6	第8届无线通信与信号处理国际学术会议 The 8th International Conference on Wireless Communications and Signal Processing（WCSP 2016)	October 13-15
7	类脑计算与混合智能国际研讨会 The International Symposium on Neuromorphic Computing and Cyborg Intelligence	October 23-24
8	第四届纳米光纤及应用国际学术研讨会 The 4th International Workshop on Optical Nanofiber Applications	October 23-26
9	第二届西湖国际光电子论坛 The 2nd West-Lake photonics Forum	November 7
10	西湖国际电磁感知研讨会 West Lake International Symposium on Electromagnetic Sensing (WISES)	November 14-16

2016要闻
News 2016

2月25日，浙大新增网络空间安全一级学科博士学位授权点，计算机学院为牵头单位

On Feb. 25th, Cyberspace Security, the doctorate programs of primary discipline, was established which is led by CCST.


3月14日，信息学部召开2016年度工作会议，总结2015年工作和研讨2016年重点工作

On Mar. 14th, FIT held the annual work conference to sum up the work in 2015 and discuss the major tasks in 2016.

4月27日，信电学院汪小知副教授负责的"基于可延展柔性电子技术的人造皮肤"入选浙江大学2015年度十大学术进展

On Apr. 27th, the project chaired by Assoc. Prof. Wang Xiaozhi was voted on the list ZJU TOP ten Academic Progress in 2015 for the research in the skin-like sensor system based on stretchable electronics.
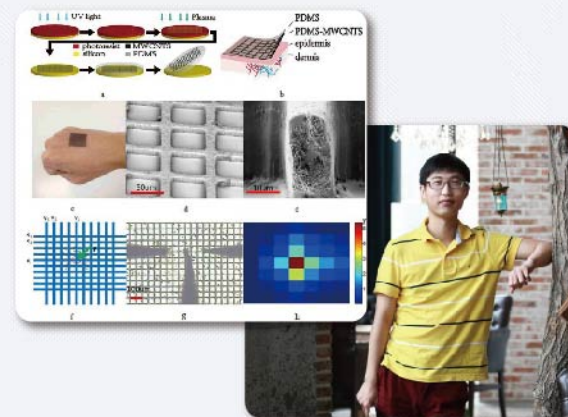
5月16日，由浙江大学主办工学部与信息学部联合承办的亚洲工学院院长峰会在浙江大学举行

On May 16th, Asian Engineering Deans' Summit (AEDS), hosted by FE and FIT, was held at ZJU.

7月6日，信息学部举办高端学术论坛--智能网络与安全研讨会，于全院士受邀做学术报告

On July 6th, the high-level series forum of ZJU academic annual meeting, on the theme of intelligent network and security, was successfully held by FIT. Academician Yu Quan was invited to deliver excellent reports.

7月20日，浙江大学与华为技术有限公司签约共建电磁技术创新联合实验室

On July 20th, the cooperation agreement to build joint laboratory of electromagnetic technology innovation was signed between ZJU and HUAWEI TECHNOLOGIES CO., LTD.

11月15日，图灵奖获得者Raj Reddy教授做客海外名师大讲堂

On Nov. 15th, Prof. Raj Reddy, winner of the Turing Award, delivered a speech which is part of the Qizhen Global Vision Lecture Series in celebration of the coming 120th anniversary of Zhejiang University.

浙江大学信息学部文件

信息学部发[2016]003 号

关于表彰2016年信息学部青年创新奖获得者的决定

11月28日，信息学部举办2016年青年创新奖评选活动，4位青年教师获奖

On Nov. 28th, the 2016 Youth Innovation Award of FIT was voted. 4 excellent teachers won the prize.

12月26日，计算机学院吴朝晖教授主持的"脑机融合的混合智能理论与方法"入选2016年度"中国高等学校十大科技进展"

On Dec. 26th, the project chaired by Prof. Wu Zhaohui was voted as 2016 China University TOP ten Sci&Tec Progress for the research in Brain-Machine-Integrated Cyborg Intelligence: Theories and Methods
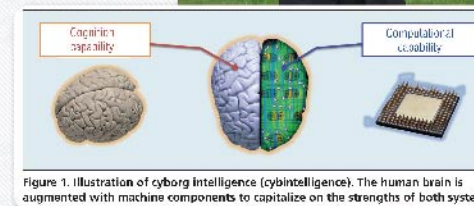
2016年，信息学部资助承办4项高层次学术活动——120周年校庆学术大讲堂

In 2016, 4 high-level academic activities were supported by FIT as the part of the Distinguished Academic Lecture Series in celebration of the coming 120th anniversary of ZJU.

2016年，新加坡科技设计大学、墨尔本大学工学院和日本早稻田大学代表团访问信息学部

In 2016, the delegations from Singapore University of Technology and Design, University of Melbourne and Waseda University visited FIT.

控制学院孙优贤教授荣获浙江大学"竺可桢奖"

Prof. Sun Youxian from CSE was honored as "Chu Kochen Award", the highest accolade of ZJU.

控制学院陈积明和熊蓉教授分获唐立新优秀学者奖、优秀教师奖，光电学院王晓萍教授获唐立新优秀教师奖和宝钢优秀教师奖

Prof. Chen Jimin and Xiong Rong from CSE won the Tang Lixin Excellent Scholar Award and Excellent Teacher Award separately. Prof. Wang Xiaoping from COSE won the Baogang Excellent Teacher Award and Tang Lixin Excellent Teacher Award.
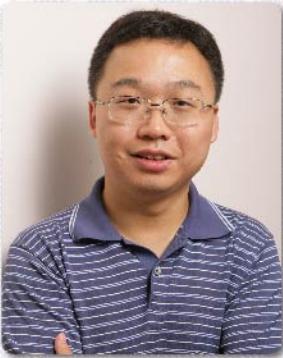

计算机学院周昆教授获陈嘉庚青年科学奖

Prof. Zhou Kun from CCST was appointed as Chen Jiageng Youth Scientist.

信电学院陈红胜教授荣获霍英东教育基金会第十五届高等院校青年教师奖二等奖

Prof. Chen Hongsheng from ISEE was bestowed the 2nd Award of Henry for 15th Young Teacher Education Foundation.