



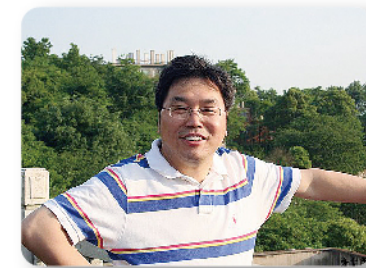
浙江大学
信息学部
Faculty of Information Technology
Zhejiang University

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个国家工程实验室，3个国家工程研究中心，共有24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 Engineering Laboratory, 3 National Engineering Research Centers, 24 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

信息学部
Annual Report 2017
FACULTY OF INFORMATION TECHNOLOGY
ZHEJIANG UNIVERSITY

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



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Wed site: <http://fit.zju.edu.cn>
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Annual Report 2017

AnnualReport 2017

Faculty of Information Technology
Zhejiang University

目录 Contents

一 学部机构 / Organization	01
二 师资队伍 / Talent Team	03
三 科学研究 / Scientific Research	09
四 人才培养 / Education	27
五 海外交流 / International Exchange	32
六 2017要闻 / News 2017	33

学部机构

Organization



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
张明璋 章献民 张朝阳 周昆 朱建科
庄越挺 彭金荣 严晓浪 应义斌

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 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 |

Academic Exchange and Cooperation Committee

- ◆ Director: Li Erping Vice-Director: Qiu Min
- ◆ Committee members:
- Chen Jiming Tian Jingkui Zhang Zhaoyang Zhou Kun

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

信息学部
Faculty of Information Technology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

师资队伍

Talent Team

教职员工690人，其中教学科研岗411人，教授206人，副教授175人。有中国工程院院士4人，中国科学院院士1人，“万人计划”入选者12人（科技创新领军人才6人、青年拔尖人才6人），

教育部长江学者18人（其中特聘教授11人），973首席科学家6人，国家百千万人才工程入选9人，教育部高校教学名师1人，科技部中青年科技创新领军人才4人，国家自然科学基金杰出青年获得者16人，优秀青年基金获得者10人，浙江省特级专家6人。国家自然科学基金创新群体3个，教育部创新团队2个。

2017年新增中国科学院院士1人，“万人计划”科技创新领军人才2人，

教育部长江学者特聘教授1人，青年长江学者1人，国家杰出青年基金获得者2人，国家优秀青年基金获得者1人，国防科技卓越青年人才1人。11位教师晋升教授，7位教师晋升副教授。

FIT has 690 faculty and staff members, including 411 faculty members, among which 206 are full professors and 175 are associate professors. There are 4 members of Chinese Academy of Engineering and 1 member of Chinese Academy of Sciences, 12 talents of National High-level Talents Special Support Program (6 Sci & Tech Innovation Leaders and 6 Youth Talents),

18 professors of "Cheung Kong Scholar Program", 6 Chief Scientists of National

"973" Program, 9 professors of National Bai-Qian-Wan Talent Project, 1 outstanding teacher in universities of MOE, 4 Sci & Tech Innovation Leaders of MOST, 16 National Distinguished Youth Science Foundation Fellows, 10 National Excellent Young Science Foundation Fellows, 7 Zhejiang Province Outstanding Experts, 2 Innovative Research Groups of the NSFC and 3 Innovative Research Teams of Ministry of Education.

In 2017, 1 professor was elected as member of Chinese Academy of Sciences, 2 professors were chosen as Sci & Tech Innovation Leader of National High-level Talents Special Support Program,

2 professors were engaged in National Cheung Kong Scholar Program (1 Youth Talents), 1 professor was appointed as National Defense Sci & Tech Outstanding Youth Talent. 2 professors obtained National Science Funds for Distinguished Young Scholars, 1 professor obtained National Science Fund for Excellent Young Scholars, 11 teachers were promoted to full professors and 7 teachers were promoted to associate professors.

师资队伍职称结构
Professional Structure



2017年新增 Awarded in 2017

中国科学院院士
Academician of Chinese Academy of Science



吴朝晖
Wu Zhaozhai

“万人计划”科技创新领军人才

Sci & Tech Innovation Leaders in National High-level Talents Special Support Plan



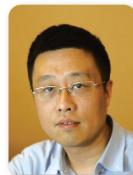
尹建伟
Yin Jianwei



陈刚
Chen Gang

长江学者教授

Professors in "Cheung Kong Scholar's Program"



陈刚
Chen Gang



程鹏
Cheng Peng

专家 教授

Experts



储涛
Chu Tao



任奎
Ren Kui

青年专家
Youth Experts



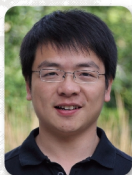
李林军
Li Linjun



沙 威
Sha Wei



赵松睿
Zhao Songrui



周晓巍
Zhou Xiaowei



吴均峰
Wu Junfeng



郑友怡
Zheng Youyi



丁 萁
Ding Nai



张 伟
Zhang Yi

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



张朝阳
Zhang Zhaoyang



戴道铨
Dai Daoxin

国防科技卓越青年人才
National Defense Sci & Tech
Outstanding Youth Talent



赵民建
Zhao Minjian

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



葛志强
Ge Zhiqiang

教授
Professors



刘 东
Liu Dong



李 强
Li Qiang



黄腾超
Huang Tengchao

教授 Professors



陈惠芳
Chen Huifang



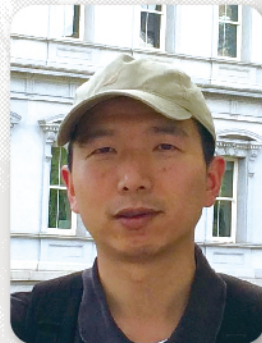
余官定
Yu Guanding



郑史烈
Zheng Shilie



杨秦敏
Yang Qinmin



钱 徽
Qian Hui



肖 俊
Xiao Jun



章国锋
Zhang Guofeng



刘济全
Liu Jiquan

副教授 Associate Professors



周春琳
Zhou Chunlin



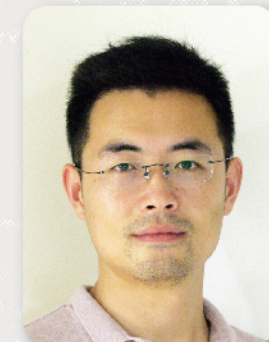
陈 翔
Chen Xiang



刘而云
Liu Eryun



杨 柳
Yang Liu



厉向东
Li Xiangdong



叶 志
Ye Zhi



徐雯洁
Xu Wenjie

引进教师 New Faculty Members

程 然 Cheng Ran	储 涛 Chu Tao	金潮渊 Jin Chaoyuan	李林军 Li Linjun	李 楠 Li Nan	刘雪明 Liu Xueming	沙 威 Sha Wei
孙一军 Sun Yijun	孙 煜 Sun Yu	万 浩 Wan Hao	吴均峰 Wu Junfeng	吴仍茂 Wu Rengmao	夏明俊 Xia Mingjun	张 婷 Zhang Ting
张 伟 Zhang Yi	郑 斌 Zheng Bin	郑友怡 Zheng Youyi	周晓巍 Zhou Xiaowei	周亚金 Zhou Yajin	邹 宁 Zou Ning	Ribierre Jean Charles

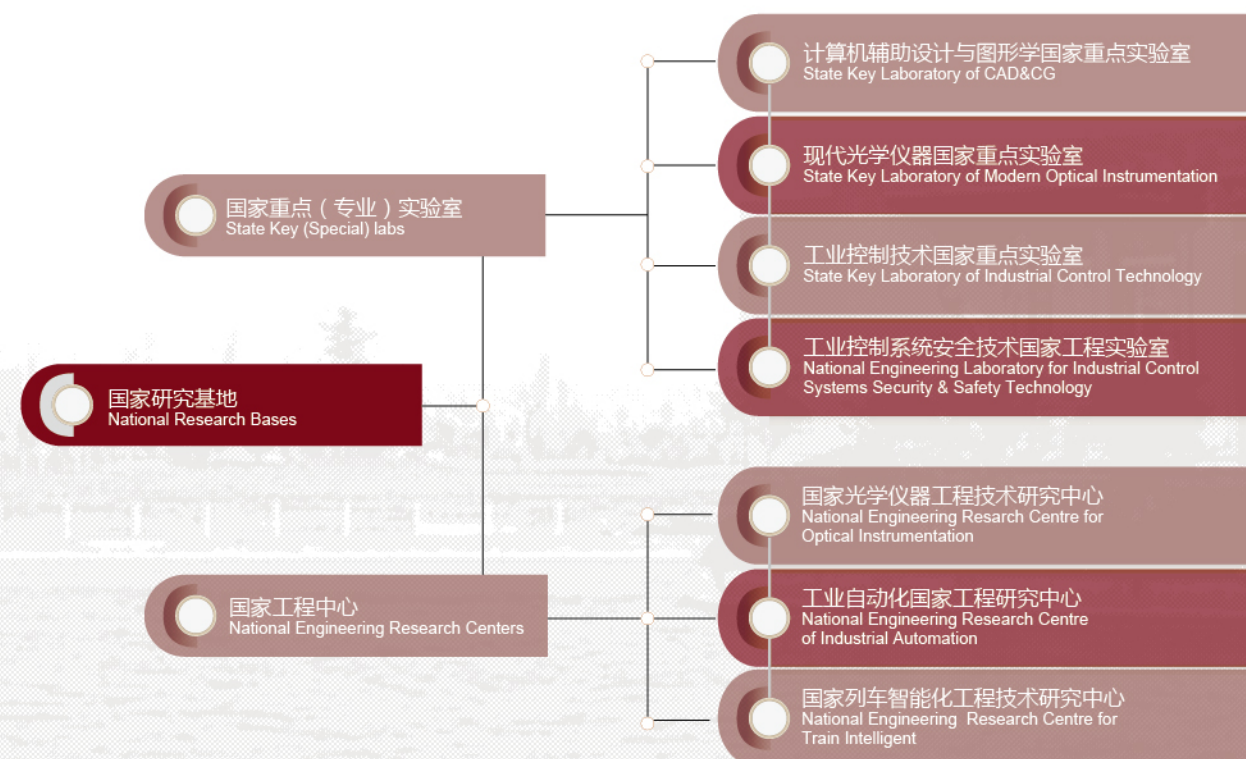
科学研究

Scientific Research

2017年度学部到校科研经费逾5.9亿，其中，国家自然科学基金获批81项，合计经费逾6565万元，包括杰青2项，优青1项，重点项目4项，两化融合1项。新增千万级项目共15项，新建5个校企联合研发中心(实验室)。发表论文SCI收录超760篇，其中高水平论文占40%。获国家授权发明专利424项。获国家技术发明二等奖、浙江省自然科学一等奖、教育部高等学校科技进步一等奖和国防技术发明一等奖各1项。

In 2017, the total research funding of FIT reached over 590 million RMB. 81 grants with the amount up to 65.65 million RMB were approved by the National Natural Science Foundation of China (NSFC) , including 2 projects for distinguished young scholars, 1 project for excellent young scholars. Meanwhile, there were 15 new projects supported with over ten million each, More than 760 papers were indexed by SCI and 424 national patents have been approved this year. 1 project was awarded the 2nd prize of National Technology Invention Award. Furthermore, 5 Joint Research Centers or Laboratories between ZJU and enterprises were established in 2017.

国家研究基地 National Research Bases



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 and 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 and Electromagnetic Research	何赛灵 Prof. He Sailing
信息与电子工程学院 Information Science and Electronic Engineering	光学惯性技术工程中心 Center for Optical Inertial Technology	刘 承 Prof. Liu Cheng
	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
控制科学与工程学院 Control Science and Engineering	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
	工业控制研究所 Inst. of Industrial Process Control	孙优贤 Prof. Sun Youxian
计算机科学与技术学院 Computer Science and Technology	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
	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
软件学院 Software Technology	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
	生物医学工程研究所 Inst. of Biomedical Engineering	夏 灵 Prof. Xia Ling
	数字技术及仪器研究所 Inst. of Digital Technology & Instrument	陈耀武 Prof. Chen Yaowu
生物医学工程与仪器 科学学院 Biomedical Engineering & nstrument Science	医疗健康信息工程技术研究所 Inst. of Biomedical Information	叶学松 Prof. Ye Xuesong

科研亮点 Research Highlights

1. 学部青年创新奖 Youth Innovation Awards

生仪学院
张明璋 副教授**研究方向:** 生物制造与多功能药物载体

简介:主要从事电场辅助微纳米药物载体的研究工作,解决了微纳米3D打印、回转式打印、静电喷雾与静电纺丝的包覆、储存与释放机制,以及复合药物载体有序图案堆叠的产率优化,提供多功能药物载体在个性化与精准化的新应用。相关成果在ACS Appl. Mater. Interfaces, Chemical Engineering Journal, Scientific Reports等期刊上发表SCI论文30余篇。2015获得China-Europe Symposium on Biomaterials in Regenerative Medicine壁报奖。

Biofabrication and Multifunctional Drug Delivery Systems

The researcher focuses mainly on multi-functional micro/nano-scaled drug delivery systems and their preparation combining traditional and advanced manufacturing approaches. These include 3D printing, centrifugal printing, electrospraying and electrospinning methods. His most recent research contributions include development of 3D micro/nano-scaled stacked fibers with accurate patterning and spatial arrangement which has led to improved functionality, production rate and safety for greater personalized healthcare applications. More than 30 papers were published in such as ACS Appl. Mater. Interfaces, Chemical Engineering Journal, Scientific Reports, etc. The results received the Best Poster Award in China-Europe Symposium on Biomaterials in Regenerative Medicine, 2015.

信电学院
钟财军 副教授**研究方向:** 无线通信与无线网络

简介:主要从事5G及未来移动通信系统基础理论和关键技术研究,在分布式多天线系统容量理论、信息与能量协同传输方法和干扰环境下协作通信机制等方面取得了一系列创新性研究成果,发表IEEE期刊论文70余篇,其中6篇入选ESI高被引论文,谷歌学术引用3100余次。获2013年度IEEE通信学会亚太地区杰出青年研究员奖和浙江省杰出青年基金资助,部分研究成果获2017年度中国电子学会科学技术奖(自然科学类)二等奖。

Wireless Communication and Networking

The research interests of the awardee lie in the fundamental theory and key technology for 5G and beyond wireless communications systems. He has made a series of innovative contributions in the area of capacity theory of distributed MIMO systems, methods for simultaneous information and power transfer, and cooperative mechanisms in the presence of interference. He has published more than 70 IEEE journal papers, of which 6 were selected as high-cited papers by ESI. The papers have been cited more than 3100 times according to Google Scholar. Part of the research outcomes won the 2nd prize of Science and Technology Award by the Chinese Institute of Electronics. The awardee also won the 2013 IEEE ComSoc Asia-Pacific outstanding young researcher award and gained the Zhejiang Provincial Natural Science Foundation for Distinguished Young Scholars.

控制学院
吴争光 研究员**研究方向:** 混杂系统

简介:主要从事混杂系统的研究工作,提出了基于隐Markov模型的非同步控制器和基于非齐次Markov链的非同步滤波器设计方法,在统一的框架内实现了Markov跳变系统控制器/滤波器设计。申请人出版英文专著3部,在IEEE系列汇刊和Automatica上发表论文54篇,其中2篇论文分别入选2013年和2014年中国百篇最具影响国际学术论文。论文被SCI他引2821次,单篇最高被他引219次,h指数为35,ESI高被引论文26篇。申请人在2014年-2017年连续四年入选Elsevier中国高被引学者,在2017年入选Clarivate Analytics全球高被引科学家。

Hybrid Systems

The researcher mainly focuses on hybrid systems. The design methods of asynchronous controller and filter have been given based on hidden Markov model and nonhomogeneous Markov chain, respectively, and the design methods of control/filter for Markov jump systems have been realized in the unified frameworks. Three English monographs and 54 papers have been published. Two of those papers are selected as the Most Influential International Academic Papers in China in 2013 and 2014, respectively. All the published papers have been cited 2821 times in total by other SCI papers and the most one has been cited 219 times. The h-index of the applicant is 35 and 26 papers are selected as the Highly Cited Papers by ESI. The applicant is on the list of the Most Cited Chinese Researcher from 2014 to 2017 selected by Elsevier and the Highly Cited Researcher in 2017 select by Clarivate Analytics.

信电学院
叶德信 副教授**研究方向:** 新型人工电磁材料

简介:主要从事新型人工电磁材料设计与应用研究,取得的主要成果有:1)提出了完美匹配自隐形固态“电磁真空材料”的设计理论,物理实现了微波频段二维、三维全向自隐形材料;2)提出了简化参数完美匹配层吸波材料概念,设计实现了具有超薄、超宽带、全向等特性的完美匹配吸波材料;3)实验验证了有源增益负折射率材料的物理可实现性。近5年来在Science、PNAS、Nature communications、PRL等国际期刊上发表论文30余篇。

Novel Artificial Metamaterials

This honoree is mainly engaged in the design and application of artificial metamaterials, his principal achievements are as follows: 1) He proposed a constitution theory of perfectly matched invisible solid “electromagnetic free space”, and physically realized 2D, 3D omnidirectionally invisible microwave artificial materials; 2) He proposed the model of modified perfectly matched layer, and experimentally designed ultra-thin, ultra-wide band, omnidirectional perfectly matched absorbers; 3) He experimentally verified the realizability of negative index metamaterial with net gain. During the recent 5 years, more than 30 papers have been published in high impact journals such as Science, PNAS, Nature communications, PRL, etc.

光电学院
吴仍茂 研究员**研究方向:** 自由曲面光学、成像系统设计

简介: 主要从事自由曲面光学、成像系统设计的研究工作。在光束调控方面, 针对零光展度光束调控建立了一种有效的自由曲面Monge-Ampère设计方法, 针对非零光展度光束调控建立了一种有效的非球面直接设计方法, 形成一套完善的自由曲面光束调控理论。在成像设计方面, 提出了一种基于B-Spline面型的自由曲面成像设计方法。近年来在包括Laser and Photonics Reviews、Optica、Optics Letters、Optics Express等重要学术期刊上发表SCI论文30余篇。2017年获中国仪器仪表协会“金国藩青年学子奖学金”。

Freeform Optics and Imaging Systems Design

The researcher mainly focuses on Freeform Optics and Imaging Systems Design. His research contributions include developing a Monge-Ampère method which is very effective in designing freeform illumination optics for zero-étendue light beam, and a direct design method which is very effective in designing aspherical illumination optics for nonzero-étendue light beam, as well as developing an optimization method for designing B-Spline freeform imaging optics. More than 30 papers have been published in some high-quality journals, such as Laser and Photonics Reviews, Optica, Optics Letters, Optics Express, etc. He received Jin Guofan Prize for Excellent Youth of China Instrument Society Scholarships in 2017.

控制学院
朱秋国 讲师**研究方向:** 智能机器人

简介: 主要从事智能机器人动态运动规划与控制研究。提出了基于串联弹性驱动关节的膝踝协调最优控制方法和基于动量守恒的力矩轮廓控制方法, 解决了机器人跳跃中的高能效和动态平衡问题。提出了机器人对地面的反作用力控制方法, 实现了机器人的快速跑跳运动。主持科技委项目、国家自然科学基金、省级项目和企业项目10余项, 发表SCI/EI论文30余篇, 授权发明专利20余项, 授权美国发明专利1项, 2013年浙江省科技奖一等奖, 2014年浙江省教学成果奖一等奖, 2017年浙江大学先进工作者。

Intelligent Robot

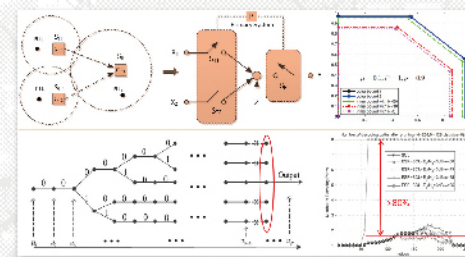
The researcher mainly focuses on dynamic motion planning and control. His research contributions include proposing optimal control of coordinated between knee and ankle joints based on serial elastic actuator and torque profile control based on conservation of momentum to solve the high-efficiency and dynamic balance problems on the hopping and running robot and presenting the control method of reaction force to the ground of robot to realize fast locomotion. The researcher has taken charge more than 10 projects like to National Defense Innovation, National Science Foundation of China, et al, has more than 30 SCI/EI papers published, and more than 20 invention patents authorized, one of which is for American invention. Besides, the researcher gained the first class prize of Zhejiang Science and Technology Prize in 2013, the first class prize of Zhejiang Teaching Prize in 2014.

2. 新增国家重大科研项目 New National Important Projects**① 无线通信容量理论与编码传输技术**

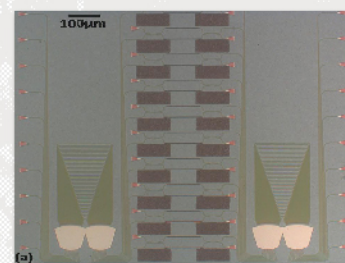
信电学院张朝阳教授在信息论指导下, 研究和探索了典型场景下若干无线通信系统的容量理论和新型编码传输接入技术。获2017年国家杰出青年科学基金资助, 未来将重点探索面向6G和下一代物联网(IoT)的大规模通信组网与大数据分析计算协同融合的基础理论与方法, 突破计算与通信协同融合的新型架构、算法和协议, 为未来感知、互联与计算一体化智能信息服务系统的设计提供思路。

Capacity Theories and Coding Techniques in Wireless Communications

The project, supported by NSFC for Distinguished Young Scholars in 2017, will focus on the complicated interplay between the large-scale communication & networking and the big-data analysis & computing as in the next generation (6G) wireless communication systems and IoT, with a goal to obtain new architectures, algorithms and protocols supporting synergetic convergence of communication and computation, as well as to provide new approaches for the design of future intelligent information service system with integrated capabilities of sensing, connecting and computing.

**② 硅基光子学**

光电学院戴道铎教授获2017年国家杰出青年科学基金资助, 他长期从事硅光子集成与器件及应用方面研究。本项目将聚焦于“硅+光子器件与集成: 从近红外到中红外”的理论与实验研究, 实现快速、高效、低功耗的硅基光电子器件及集成, 并将其工作波段延伸至中红外波段, 以满足片上光网络、片上实验室等对高性能光子器件与集成的迫切需求。

**Silicon Photonics**

The project, supported by NSFC for Distinguished Young Scholars in 2017, will focus on the development of silicon-plus photonics for near infrared & mid-infrared light. It aims to realize ultra-fast silicon photonic integrated devices and circuits with high efficiency and low power consumption, in order to satisfy the increasing demand for photonic networks-on-chip as well as photonic lab-on-chip.

③ 过程数据建模与应用

由控制学院葛志强教授负责的该项目获2017年国家基金优秀青年基金资助, 他长期从事过程数据建模与应用方面的研究。本项目将重点研究工业大数据驱动的大规模厂级过程建模、监测与故障诊断以及关键性能指标预测等, 构建基于云计算的过程工业大数据建模和应用新框架, 建立面向过程工业大数据的建模理论与方法体系, 实现相关理论与方法在大型过程企业中的实际应用。

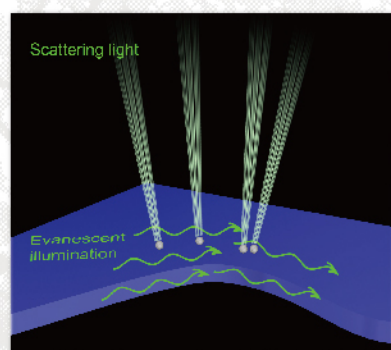
Process Data Modeling and Applications

The project, supported by NSFC for Excellent Young Scholars in 2017, will make the following major scientific endeavors: developing industrial big data driven modeling methods for monitoring, fault diagnosis and key performance indices prediction in large-scale industrial processes; proposing a new cloud computing architecture for big data modeling and applications in the process industry; building a series of theories and methods for process big data analytics.



4 基于移频机制的宽场非标记超分辨成像新方法研究

由光电学院刘旭教授领衔的该项目获批2017年国家基金重点项目资助，他长期从事移频超分辨成像和荧光标记超分辨成像研究工作。本项目将围绕基于移频机制的宽场非标记超分辨成像，重点研究微纳样品空间频谱信息大范围频移的实现和不同频移量信息在傅里叶频谱域的迭代拼接、图像重构；通过对微纳光源的光束调控研究，构建超分辨芯片；结合优化处理算法，提高成像信噪比；发展移频成像的相位高分辨成像方法，探索对微纳样品三维超分辨成像的新方法。



Wide Field Label-free Super-Resolution Imaging Based on Spatial Frequency Shift Effect

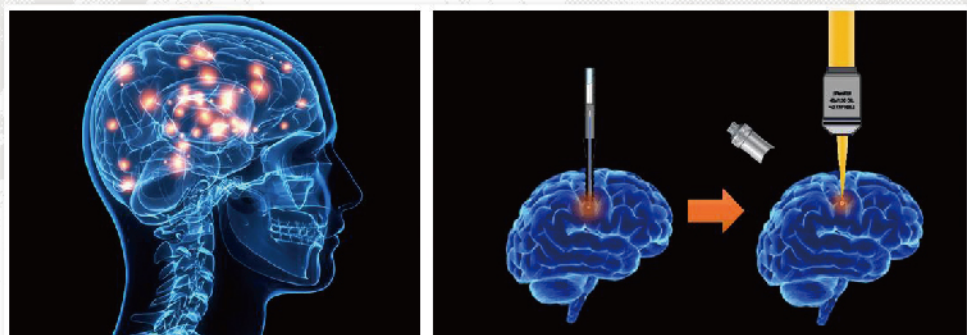
The project, as the key project of NSFC, a novel super resolution method has been proposed based on the frequency-shift effect. The project will do the following major research: Finding a way to realize large scale spatial frequency-shift of the sample with different amount and realize the iterative reconstruction of these frequency-shift information; Studying the modulation on nano illumination beam and constructing a super resolution chip for nanoscopy; Combining with optimization algorithm to improve image SNR; Carrying out the research on phase imaging technology to realize three dimensional super-resolution image of the sample.

5 深穿透多尺度光遗传学精准操控方法研究

光电学院斯科教授负责的该项目获批2017年国家基金重点项目资助。该项目拟克服现有光遗传学技术性能上的不足，提出非侵入性深穿透多尺度分辨的光遗传学操控方法，通过研发并融合新型红外上转换纳米材料、基于散射补偿的深穿透双光子光遗传技术和声光混合超深穿透光聚焦技术，实现浅层亚微米尺度、深层（毫米级深度）亚细胞尺度的精准光遗传学操控，并开展脑网络的宏环路、环路和微环路的相关研究。有望在细胞、环路、脑区层次上为脑科学和脑疾病的研究提供新思路，为形成具有自主知识产权的光遗传学技术产品奠定基础。

Precise Optogenetics Method with Deep Penetration Depth and Multi-Scale Resolution

Prof. Si Ke from OSE College, supported by the key project of NSFC, proposes a non-invasive optical manipulation method to overcome the deficiencies of current Optogenetics tools. By integrating new nano-materials, two-photon optogenetics, and deep tissue focusing techniques, he tries to establish an optical system to non-invasively achieve precise optical manipulation with subcellular or even higher resolution deep into the brain. The implementation of this project may pave the way for many important applications in brain research, such as neural circuits' discovery and brain diseases diagnosis.



6 服装电子商务中的真实感建模与体验

由计算机学院冯结青教授领衔的该项目获批2017年国家基金重点项目资助。本项目研究服装电子商务真实感建模与体验的理论、方法和关键技术。研究个性化服装自主设计、徒手交互虚拟试衣、服装推荐、可变尺寸试衣机器人等关键技术，并研发面向电子商务的软硬件结合的具有高度真实感的试衣系统原型。探索面向服装个性化设计、真实感体验、生产和消费一体化的电子商务新流程，为“互联网+”时代的服装电子商务升级提供理论基础和技术支撑。



Realistic Modeling and User Experience for Fashion E-Commerce

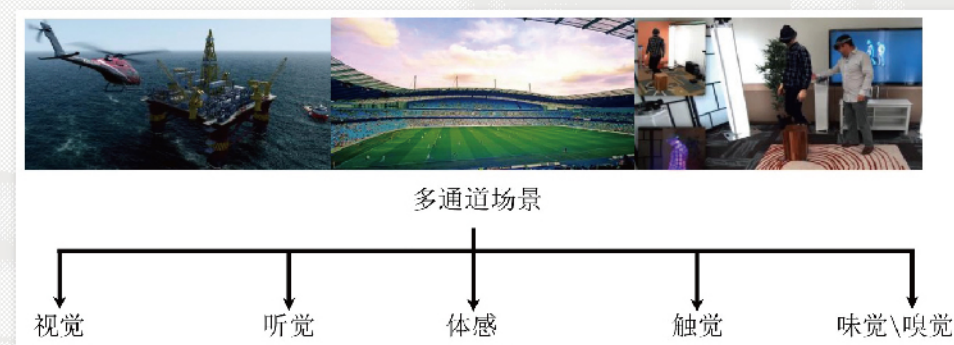
In this project, we will investigate the theories, methods, and key techniques of realistic modeling and user experiences in the whole process of fashion e-commerce. Meanwhile, we will investigate and implement the key techniques of e-commerce oriented personalized fashion design, freehand interaction-based virtual try-on, machine learning based fashion recommendation, size variable fitting robot, etc. Finally, we will develop a realistic try-on prototype system integrating both hardware and software. The research will be helpful to explore a new process of fashion e-commerce and provide the rigorous theoretical basis and technical support for fashion e-commerce upgrade in the "Internet plus" era.

7 大数据学习的多通道虚拟环境自动构建

计算机学院许威威教授负责的该项目获批2017年国家基金重点项目资助。本项目以语义对象为多通道信息组织中心，有机融合虚拟/增强现实技术与基于大数据的机器学习技术，构造数据驱动的虚拟环境自动构建新范式和技术手段，具体研究内容包括视听与体感数据集构建、场景知识层次组织和学习、多通道虚拟环境三维重建与自动合成。

Automatic Multi-Modal Virtual Environment Construction Driven by Big Data

This project is funded by NSFC key project program, led by Prof. Xu Weiwei from CS College. The approved project organizes multi-channel perception information in an object-oriented manner, combines the virtual/augmented reality, big data and machine learning techniques to create novel techniques for virtual environment construction, including the construction of visual and auditory channel data set and body motion sensing dataset, hierarchical organization of environment knowledge, and the 3D reconstruction and automatic synthesis of virtual environments.

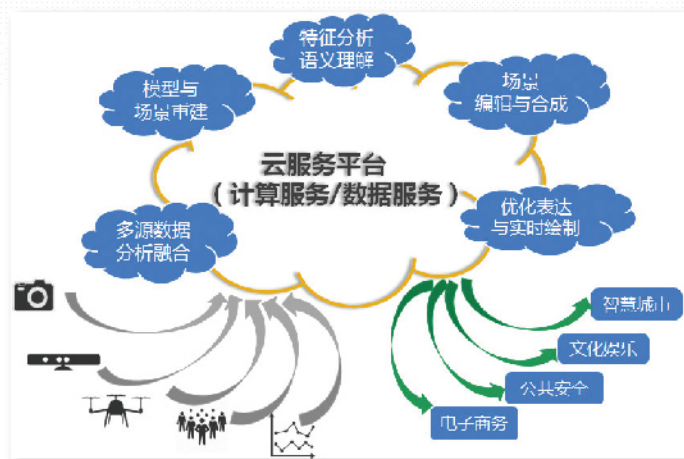


8 多源数据驱动的智能高效场景建模与绘制引擎

由计算机学院金小刚教授领衔的该项目获2017年国家重点研发计划资助。项目针对虚拟现实应用面临场景建模效率低、智能化不高、鲁棒性与接入性差，超大规模场景实时绘制难以实现，云计算环境下的建模和绘制软件平台缺乏等重大挑战，研发云-端结合的复杂场景智能建模软件平台和实时绘制引擎，形成多源数据驱动的智能高效场景建模与实时绘制的方法体系，在电子商务等领域实现应用示范。

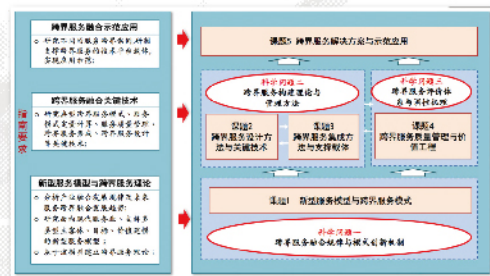
Efficient Scene Reconstruction and Rendering Engine Driven by Multi-Source Data

The project, supported by the National Key R&D Program of China in 2017, will investigate the challenges in virtual reality applications, such as scene reconstructions with low efficiency, low intelligence, rendering very large-scale scenes in real time. The research will develop intelligent modeling software platforms and rendering engines for complex scenes by jointly considering the resource allocation between cloud and client, form a new methodology for them driven by multi-source data, and apply the developed technologies in demonstration applications such as e-commerce.



9 跨界服务融合理论与关键技术

由计算机学院尹建伟教授领衔的该项目获2017年国家重点研发计划资助。本项目围绕跨界服务的三大重要科学问题，重点研究面向跨界融合的服务建模、管理及工程化实现方法，突破跨界服务模式计算、跨界服务设计、集成与质量管理等关键技术，研制跨界服务技术支撑平台并展开示范应用。

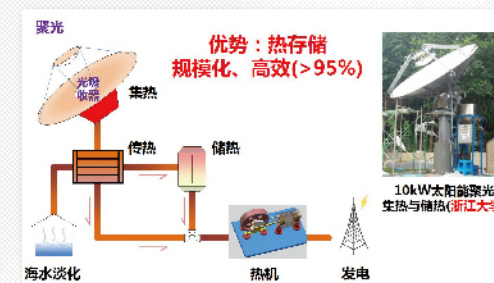


The Theories and Key Technologies of Crossover Services

This project directed by Prof. Yin Jianwei from CS college was supported by the National Key R&D Program of China in 2017. The research on three key scientific problems will focus on service modelling, management and engineering methods. It was supposed to provide the solutions for the key technologies such as service pattern computing, crossover service design, integration and quality management. A supporting software platform will be developed and used in different areas in this project.

10 表面等离激元高效光热转换机理、器件及太阳能热利用

由光电学院仇旻教授领衔的该项目获2017年国家重点研发计划资助。高效光热转换是目前光热发电、海水淡化等太阳能应用的核心技术之一。项目致力于阐明表面等离激元纳米结构高效光热转换物理机理，发展低成本大面积光热转换材料制备工艺，研制高效太阳能光热转换器件，并实现其在太阳能热发电、海水淡化等领域的应用。



Research on Surface Plasmon Polaritons-Based Photothermal Conversion Aiming at Solar Energy Utilization

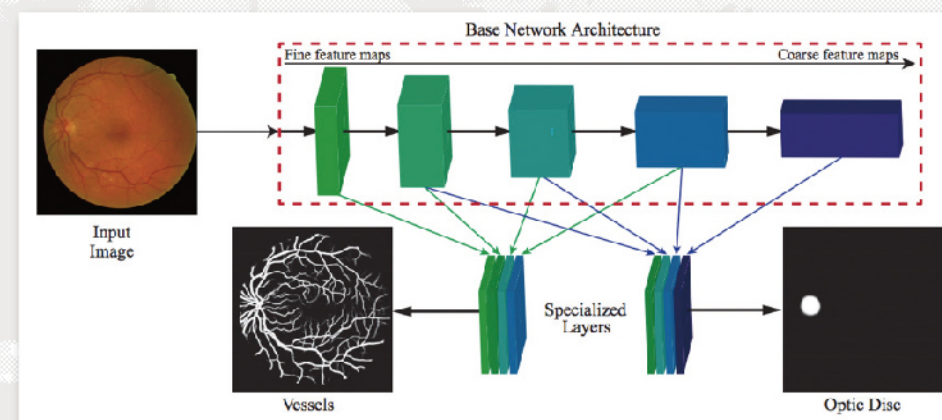
This project, led by Prof. Qiu Min from OSE College, is funded by the National Key R&D Program of China in 2017. It aims at the following four main objectives: uncovering the physical mechanism behind the highly efficient photothermal conversion using plasmonic nanostructures; developing low-cost high-throughput method of fabricating photothermal materials; fabricating devices that can efficiently transfer solar energy into heat; demonstrating the application of plasmonic photothermal conversion in solar thermal power and sea water desalination.

11 基于眼底影像的智能疾病辅助诊断系统

本千万级项目由计算机学院吴健教授负责，主要研究内容：1、模拟眼科专家”，利用图像分割技术筛选病灶，进行病灶性质细分及智能诊断；2、采用迁移学习方法，在EyePacs上的88000张眼底影像上训练模型；3、使用深度学习中的卷积神经网络，对DR数据集上实现出血、渗出等病灶自动识别，自动配准结果定量描述变化。本项目研究成果能够为DR早期诊断、治疗提供科学依据，监控病情发展。

Intelligent Computer-Aided Diagnose System Based on Fundus Images

The project, led by Prof. Wu Jian from CS College, will focus on the follows: (1) simulating the way ophthalmologists interpret fundus images and utilizing Deep learning approach to determine the nature of lesions for automatic diagnosis of DR; (2) training the model with 88000 fundus images from EyePacs dataset and validating the model with labelled DR dataset; (3) training a Convolutional Neural Network with fundus images labelled by hospital for exudations and hemorrhages detection. This project will provide a methodology support for monitoring the disease and provides a scientific basis for DR early diagnosis and treatment.



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

① 超高速数码喷印设备关键技术研发及应用

生仪学院陈耀武教授负责的该项目获2017年国家技术发明二等奖。项目攻克了困扰超高速数码喷印行业的数据实时处理、喷头实时控制和图像实时检测三大难题，成功研制了具有国际领先水平的超高速数码喷印设备。成果已出口到意大利、日本等20多个国家和地区，在国内外200多家印花企业得到成功应用，近三年新增产值3.07亿元。获授权发明专利29项，其中美国专利2项。

Research and Application of Key Technologies in Ultra-High-Speed Digital Textile Printer

The project directed by Prof. Chen Yaowu from BME College won the 2nd Prize of National Technology Invention Award in 2017. This project conquered three key difficult problems, including real-time printing data processing, real-time nozzle controlling and real-time defect detection, and finally the world-leading ultra-high-speed digital textile printer was developed. The products of this project have been exported to more than 20 countries such as Italy, Japan, and have been successfully applied to more than 200 enterprises. Sales of 307 million yuan in recent three years were created. This project has acquired 29 invention patents, including 2 USA invention patents.



② 真实感图形的高效绘制理论与方法

计算机学院周昆教授负责的该项目获2017年浙江省自然科学一等奖。项目发现了真实感图形绘制在GPU流式架构下的最优并行机制，揭示了绘制并行度与内存占用之间的动态关联性，率先建立了全GPU并行的绘制软件体系结构，设计了GPU并行空间数据结构，给出了多种视觉效果绘制的解析解和并行算法，系统解决了在GPU流式架构下真实感图形绘制软件并行化的国际性难题。10篇主要论著谷歌他引1100余次，SCI他引300余次。周昆因此成果获2011年MIT TR35青年创新人物奖、2016年陈嘉庚青年科学奖。

Theory and Methods for Efficient Rendering of Realistic Graphics

The project directed by Prof. Kun Zhou from CS College has attained the 1st prize of Zhejiang Provincial Natural Science Award in 2017. The team has discovered the optimal parallelization mechanism for photorealistic rendering under the GPU streaming architecture, revealed the dynamic relevance between the degree of parallelism and memory consumption in the rendering process, introduced the first REYES rendering architecture that runs entirely on GPUs, designed GPU spatial data structures, and developed analytical and parallel algorithms for various visual effects, leading to a systematic solution to the challenging problem of parallelizing photorealistic rendering software under the GPU streaming architecture. Ten representative papers have been cited over 1100 times according to Google Scholar and over 300 times according to SCI. Prof. Zhou had won the MIT TR35 Award of 2011 and Tan KahKee Young Scientist Award of 2016.

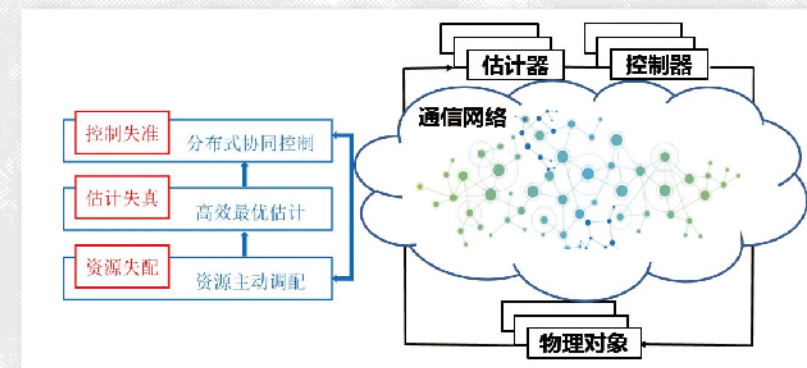


③ 网络系统资源优化与控制基础理论及方法

控制学院陈积明教授负责的该项目获2017年教育部自然科学一等奖。项目针对网络系统资源失配、估计失真、控制失准等挑战，突破已有网络系统优化与控制理论框架，成功解决了面向传输性能的资源动态分配、高效远程最优状态估计、分布式协同控制等一系列基础理论与关键技术难题，从根本上揭示了网络系统性能与网络资源的内在关系。项目研究成果发表学术论文28篇，被Google Scholar引用1600余次，被SCI他引达780余次。研究成果受到包括美国工程院院士、加拿大工程院院士等60余位IEEE/ACM Fellow的高度评价。

Resource Optimization and Control for Network Systems

The project directed by Prof. Chen Jiming from CSE College won 1st prize of the Natural Science Award of MOE in 2017. The research group established a novel optimization and control framework for network systems. They successfully solved a series of problems such as transmission performance oriented dynamic resource allocation, efficient and optimal remote state estimation, and distributed cooperative control. The project fundamentally revealed the relationships between network system performance and resources. 28 academic papers have been cited totally over 1600 times according to Google Scholar and 780 times according to non-self SCI.

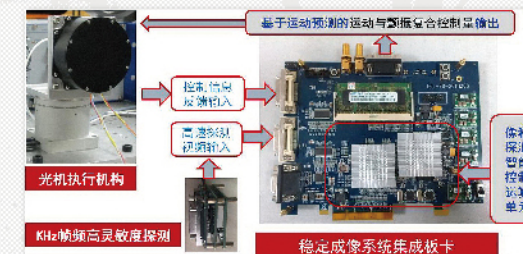


④ 卫星遥感光学稳定成像关键技术及应用

光电学院徐之海教授负责的该项目获2017年国防技术发明奖一等奖。项目研究高分辨率卫星遥感中的光学稳定成像技术，突破了由于卫星运动和颤振制约光学成像质量的瓶颈，实现了我国向该领域国际尖端水平的技术跨越。项目成果被成功应用于我国最高分辨率军用光学卫星等高分卫星型号以及嫦娥五号飞行试验器，并在中国空间技术研究院等多个国家航天主力单位中广泛推广，改善了运动模糊的影响，获得了迄今为止我国月面分辨率最高（0.97m）的可用图像，取得非常显著的军事和社会效益。

Optical Stabilization Technology for Remote Sensing Satellite

The research group directed by Prof. Xu Zhihai from OSE College has solved the problem of the image quality degradation caused by motion and vibration in optical remote sensing systems, greatly improved the imaging ability and quality of China space cameras. The Key technologies have successfully applied to China Academy of Space Technology in high-resolution earth observation satellites and lunar exploration vehicle, successfully obtained the highest resolving-power pictures (0.97 meter) of the Moon surface in China history.



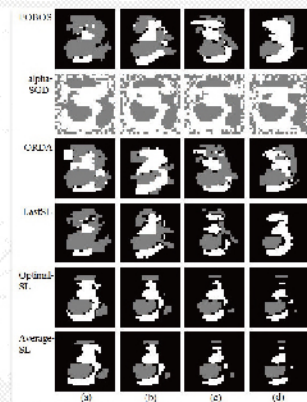
4. 年度代表性论文 Recommended Papers

1 Sparse Learning with Stochastic Composite Optimization

作者: Zhang, Weizhong; Zhang, Lijun; Cai, Deng; 等

来源: IEEE TRANSACTIONS ON PATTERN ANALYSIS AND MACHINE INTELLIGENCE 卷: 39 期: 6 页: 1223-1236 出版年: JUN 2017

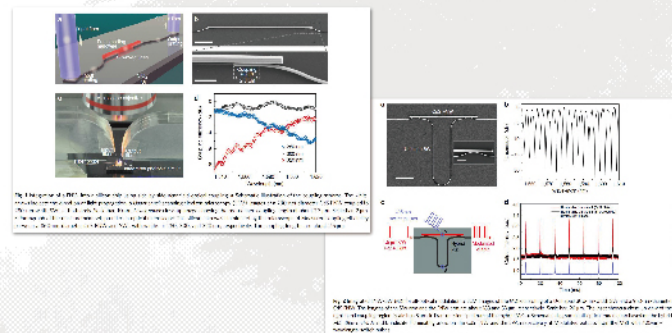
We study Stochastic Composite Optimization for sparse learning. Existing methods often fail to deliver sparse solutions due to the limited online-to-batch conversion. We propose a new scheme by adding a novel online-to-batch conversion to Stochastic Optimization algorithms. We further develop three concrete algorithms under our scheme to prove its effectiveness. The theoretical and experimental results show that our methods outperform the existing methods at sparse learning and we can improve the high probability bound from $O(\sqrt{\frac{\log(1/\delta)}{T}})$ to $O(\frac{\log(\log(T/\delta))}{AT})$.



2 Flexible Integration of Free-Standing Nanowires into Silicon Photonics

作者: Chen, Bigeng; Wu, Hao; Tong, Limin; 等

来源: NATURE COMMUNICATIONS 卷: 8 文献号: 20 出版年: JUN 2017



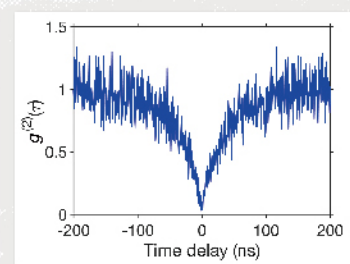
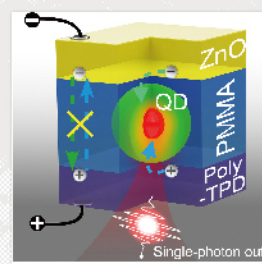
Silicon photonics shows excellent repeatability, but is limited by the material diversity. Free-standing nanowires present material diversity, but is limited by repeatability for assembling. Here we report hybrid integration of free-standing nanowires into silicon photonics via well-designed high-efficiency near-field coupling. We demonstrate hybrid nanowire-silicon photonic interferometers for enhanced optical modulation and on-chip light generation, suggesting an alternative approach to flexible multifunctional on-chip nanophotonic devices.

3 Electrically-Driven Single-Photon Sources Based on Colloidal Quantum Dots with Near-Optimal Antibunching at Room Temperature

作者: Lin, Xing; Fang, Wei; Peng, Xiaogang; 等

来源: NATURE COMMUNICATIONS 卷: 8 文献号: 1132 出版年: OCT 2017

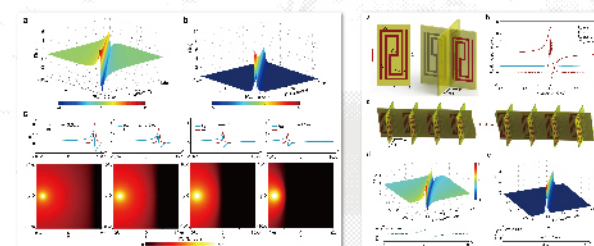
Photonic quantum information requires high-purity, easily-accessible, and scalable single-photon sources. Here we report an electrically driven single-photon source based on colloidal quantum dots. With CdSe/CdS quantum dots buried in an insulating layer, the solution-processed devices generate single photons with near-optimal antibunching at room temperature, without any spectral filtering or background correction. Such high performance is attributed to both novel device design and carrier injection/recombination dynamics.



4 Observation of Reflectionless Absorption Due to Spatial Kramers-Kronig Profile

作者: Ye, Dexin; Cao, Cheng; Zhou, Tianyi; 等

来源: NATURE COMMUNICATIONS 卷: 8 文献号: 51 出版年: AUG 2017



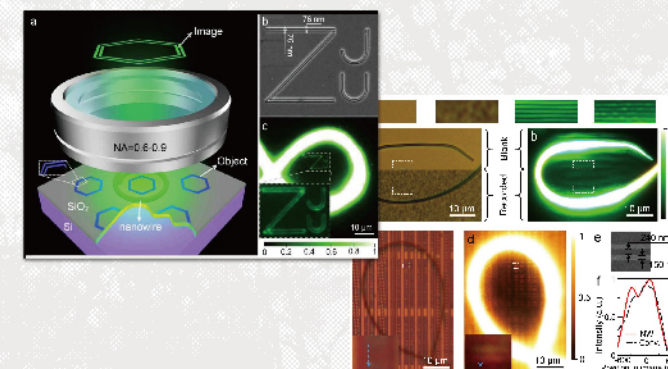
Material absorption has been extensively investigated for centuries. However, omnidirectional, reflectionless absorption has yet to be observed. In this work, we observe a wideband, omnidirectionally reflectionless absorption by constructing an inhomogeneous medium whose permittivity profile satisfies the spatial Kramers-Kronig relations in a wide band. The proposed method based on the space-frequency dispersion implies the practicability to construct gain-free omnidirectionally non-reflecting absorbers.

5 Fluorescent Nanowire Ring Illumination for Wide-Field Far-Field Subdiffraction Imaging

作者: Liu, Xiaowei; Liu, Xu; Yang, Qing; 等

来源: PHYSICAL REVIEW LETTERS 卷: 118 期: 7 文献号: 076101 出版年: FEB 2017

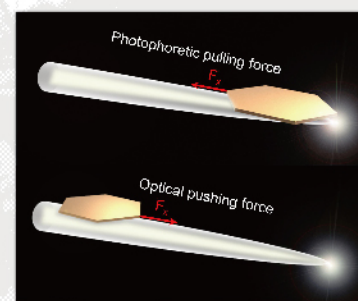
Far-field label-free super resolution imaging is of great significance to develop physics, material science, biology and chemistry etc. Current techniques are facing limitations of narrow field of view and specific working spectrum, and to achieve the wide-field, far-field label-free nanoscopy is a highly desired breakthrough. The researchers pioneered in using the fluorescent nano materials as the localized light sources and for the first time achieved the large-field, far-field, label-free super resolution imaging. The field of view is 2 orders of magnitude improved from the other reported counterparts.



6 Light-Induced Pulling and Pushing by the Synergic Effect of Optical Force and Photophoretic Force

作者: Lu, Jinsheng; Yang, Hangbo; Qiu, Min; 等

来源: PHYSICAL REVIEW LETTERS 卷: 118 期: 4 文献号: 043601 出版年: OCT 2017



This paper experimentally demonstrates that optical force and photothermal force can come together in a subtle style to drive a micron-size metallic plate moving back and forth on a tapered fiber. The experiment results of light-induced oscillation will definitely trigger many future theoretical and experimental developments and extensive applications, of which typical example includes energy conversion from light energy to mechanical energy. This paper is selected as an Editors' Suggestion paper as well as Cover Paper and featured in APS as "Focus Story".

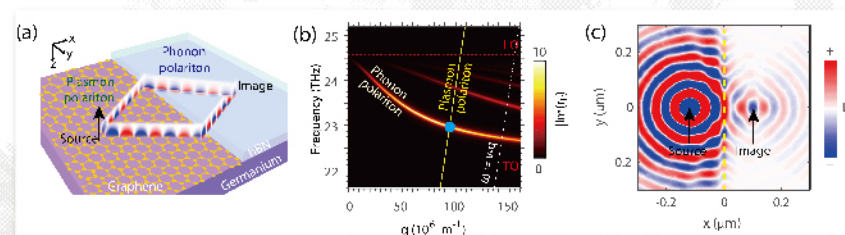
7 All-Angle Negative Refraction of Highly Squeezed Plasmon and Phonon Polaritons in Graphene-Boron Nitride Heterostructures

作者: Lin, Xiao; Yang, Yi; Chen, Hongsheng; 等

来源: PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA

卷: 114 期: 26 页: 6717-6721 出版年: JUN 2017

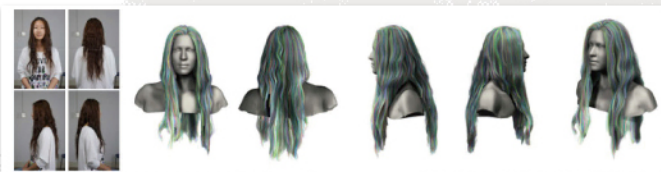
Realizing negative refraction of highly squeezed polaritons is an important step toward the active manipulation of light at the extreme nanoscale. To realize negative refraction, an effective means to tailor the coupling of different polaritons is absolutely necessary yet undeveloped. Here, we predict a viable way to flip the sign of group velocities of hybrid plasmon-phonon-polaritons in graphene-BN heterostructures, enabling all-angle negative refraction between graphene plasmons, BN's phonon polaritons and their hybrid polaritons.



8 A Data-Driven Approach to Four-View Image-Based Hair Modeling

作者: Zhang, Meng; Wu, Hongzhi; Zhou, Kun; 等

来源: ACM TRANSACTIONS ON GRAPHICS 卷: 36 期: 4 文献号: 156 出版年: JUL 2017



Given four hair images taken from the front, back, left and right views as input, we first estimate the rough 3D shape of the hair observed in the input using a predefined database of 3D hair models, then synthesize a hair texture on the surface of the shape, from which the hair growing direction information is

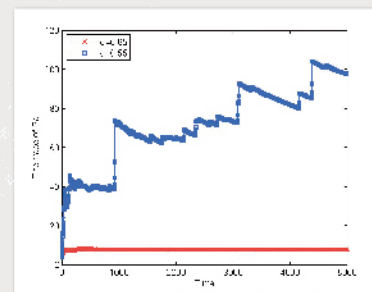
calculated and used to construct a 3D direction field in the hair volume. Finally, we grow hair strands from the scalp, following the direction field, to produce the 3D hair model, which closely resembles the hair in all input images. Our method does not require that all input images are from the same hair, enabling an effective way to create compelling hair models from images of considerably different hairstyles at different views.

9 Optimal Sensor Data Scheduling for Remote Estimation over a Time-Varying Channel

作者: Qi, Yifei; Cheng, Peng; Chen, Jiming

来源: IEEE TRANSACTIONS ON AUTOMATIC CONTROL 卷: 62 期: 9 文献号: 4611-4617 出版年: SEP 2017

The work considers sensor data scheduling with communication energy constraint for remote state estimation over a time-varying fading channel. By exploiting the feedback information, an effective closed-form dynamic stationary scheduling scheme is proposed. We prove that such simple schedule is optimal in terms of the estimation performance by comparing with a general stationary schedule under energy constraint. Furthermore, the sufficient and necessary condition for estimation stability is derived when the sensor can only use low energy at each time.



10 Adaptive Output Feedback Control for Uncertain Linear Time-Delay Systems

作者: Zhu, Yang; Krstic, Miroslav; Su, Hongye

来源: IEEE TRANSACTIONS ON AUTOMATIC CONTROL 卷: 62 期: 2 页: 545-560 出版年: AUG 2017

This paper utilizes the concept of a transport partial differential equation (PDE) representation of delayed input to solve the classic problem of output feedback control for a common category of uncertain minimum phase linear time-delay systems in spite of co-existence of unknown plant parameter and actuator delay, as well as unmeasurable ordinary differential equation

(ODE) and PDE state. In the case of measurable distributed input, the time-varying trajectory tracking is established while in the other case of unmeasurable distributed input, the constant set-point regulation is accomplished. The applicable output feedback control design incorporates the adaptive backstepping technique for ODE plants with the prediction-based boundary control method for PDE systems. There is not any limitation on relative degree of the considered systems. The Lyapunov-based analysis shows the local stability of the closed-loop ODE-PDE cascade systems.

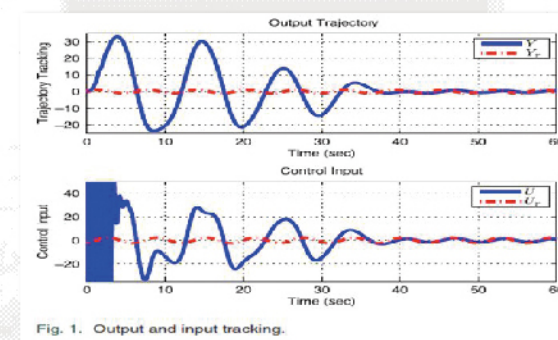


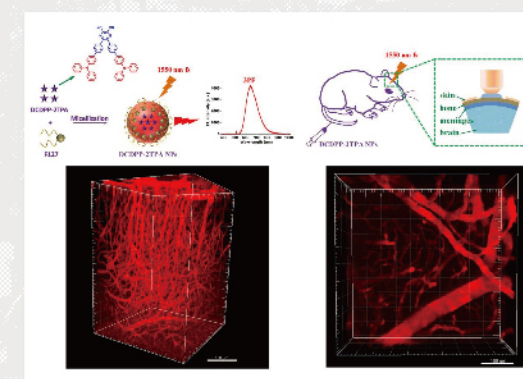
Fig. 1. Output and input tracking.

11 Aggregation-Induced Emission Luminogen with Deep-Red Emission for Through-Skull Three-Photon Fluorescence Imaging of Mouse

作者: Wang, Yalun; Chen, Ming; Qian, Jun; 等

来源: ACS Nano 卷: 11 期: 10 页: 10452-10461 出版年: OCT 2017

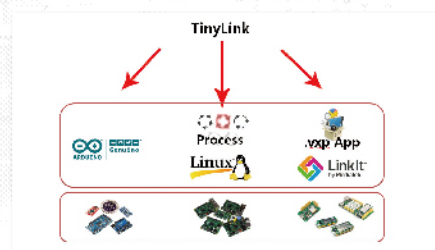
Imaging the brain with high integrity is of great importance to neuroscience and related applications. Herein, based on a type of aggregation-induced emission luminogen (AIEgen) with a large three-photon absorption (3PA) cross section at 1550 nm and deep-red emission, we realized through-skull three-photon fluorescence microscopic (3PFM) imaging of mouse cerebral vasculature without craniotomy and skull-thinning. In vivo 3PF images of the cerebral vasculature at various vertical depths were obtained, and a vivid 3D reconstruction of the vascular architecture beneath the skull was built. As deep as 300 μm beneath the skull, small blood vessels of 2.4 μm could still be recognized.



12 TinyLink: A Holistic System for Rapid Development of IoT Applications

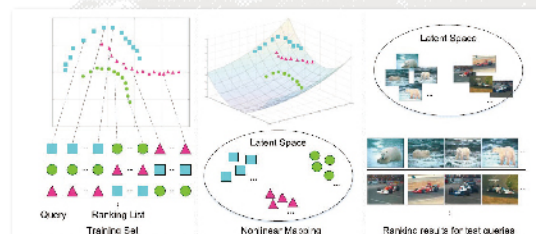
作者: Guan, Gaoyang; Dong, Wei; Gao, Yi; 等 the Best Video Award
来源: ACM MobiCom 2017(23rd) 页: 383-395 出版年: OCT 2017

The key idea of TinyLink is to use a top-down approach for designing both the hardware and the software of IoT applications. Developers write the application code in a C-like language to specify the key logic of their applications, without dealing with the details of the specific hardware components. Taking the application code as input, TinyLink automatically generates the hardware configuration as well as the binary program executable on the target hardware platform. TinyLink provides unified APIs for applications to interact with the underlying hardware components.



13 Learning Bregman Distance Functions for Structural Learning to Rank

作者: Li, Xi; Pi, Te; Zhang, Zhongfei; 等
来源: IEEE TRANSACTIONS ON KNOWLEDGE AND DATA ENGINEERING
卷: 29 期: 9 页: 1916-1927 出版年: SEP 2017

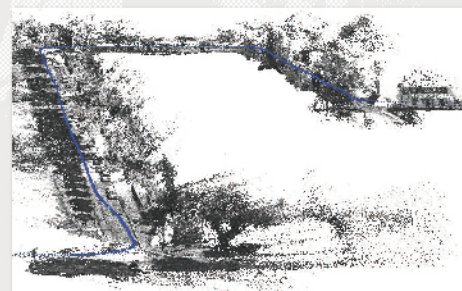


Realizing negative refraction of highly squeezed polaritons is an important step toward the active manipulation of light at the extreme nanoscale. To realize negative refraction, an effective means to tailor the coupling of different polaritons is absolutely necessary yet undeveloped. Here, we predict a viable way to flip the sign of group velocities of hybrid plasmon-phonon-polaritons in graphene-BN heterostructures, enabling all-angle negative refraction between graphene plasmons, BN's phonon polaritons and their hybrid polaritons.

14 Image Gradient-based Joint Direct Visual Odometry for Stereo Camera

作者: Zhu, Jianke <https://doi.org/10.24963/ijcai.2017/636>
来源: IJCAI 2017 (26th) 页: 4558-4564 出版年: AUG 2017

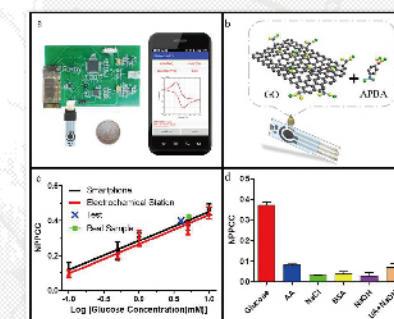
Visual odometry is an important problem in computer vision and robotics. Feature-based methods rely on the accurate correspondences, while the direct approaches could make use of whole image but suffering from local optimum. We propose a novel direct stereo odometry method to improve the convergence basin. The key is a dual Jacobian optimization scheme with a gradient-based feature representation, which is robust to illumination changes. Furthermore, a joint direct odometry approach is proposed to incorporate the information from previous keyframes.



15 Smartphone-based Cyclic Voltammetry System with GrapheneModified Screen Printed Electrodes for Glucose Detection

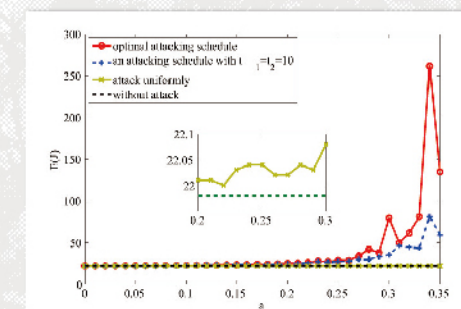
作者: Ji, Daizong; Liu, Le; Liu, Qingjun; 等
来源: BIOSENSORS & BIOELECTRONICS 卷: 98 页: 449-456 出版年: DEC 2017

In this study, a smartphone-based CV system was constructed to perform electrochemical detections. The system was composed of sensors, portable detector and smartphone. The reduced graphene oxide and sensitive substance could be modified on the sensors by the system. The experimental data of the system were shown the linear, sensitive, and specific responses to glucose at different doses, even in blood serum. Thus, the system could show great potentials of detection and modification of electrodes in various fields, such as public health, water monitoring, and food quality.



16 Optimal DoS Attack Scheduling in Wireless Networked Control System

作者: Zhang, Heng; Cheng, Peng; Chen, Jiming; 等 中国百篇最具影响国际学术论文
来源: IEEE TRANSACTIONS ON CONTROL SYSTEM TECHNOLOGY
卷: 24 期: 3 页: 843-852 出版年: MAY 2016



It is of significant interest to investigate how the attacker may optimize its attacking schedule to maximize the effect on the system performance due to the insufficiency of energy at attacker side. This work fills this gap from the aspect of control system performance. The optimal attack that maximizes the Linear Quadratic Gaussian control cost under energy constraint has been considered. This paper analyzes the properties of the cost function under an arbitrary attack schedule, derives the optimal attack schedule.

人才培养

Education

学部共有13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）7755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 13 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 7755 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
	产品设计 Product Design
生物医学工程与仪器科学学院 Biomedical Engineering & Instrument Science	信息安全 Information Safety
	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		227	242	198	434	/	202	1303
	硕士生 (全日制) Master		344	557	419	978	590	289	3177
	本科生 (14级、 15级、16级) Undergraduate		354	911	390	1220	/	400	3275
招生数 Freshmen	博士生 Doctor		50	56	45	80	/	45	276
	硕士生 (全日制) Master		134	250	151	346	349	103	1333
	本科生 (17级) Sophomore		111	279	130	356	/	109	985
毕业生 Graduates	博士生 Doctor		60	46	56	98	/	27	287
	硕士生 (全日制) Master		112	144	135	319	211	99	1020
	本科生 Undergraduate		126	276	143	405	/	128	1078
本科生深造 与对外交流 Further Study and International Exchange of Undergraduate	毕业生* Graduate*		115	274	127	370	/	128	1014
	出国 (境) 深造率 Ratio of Further Studies Aboard		26.09%	16.42%	25.2%	25.9%	/	18.80%	22.38%
	国内读研率 Ratio of Further Studies at Home		44.35%	43.80%	55.1%	26%	/	28.57%	36.86%
	对外交流人次 International Exchange		61	117	48	185	/	37	448

*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 Advisor
2017年国际大学生程序设计竞赛 ACM International Collegiate Programming Contest Asia Region (ACM-ICPC)	亚洲赛区冠军 Champion in Asia Regional Contest	Legilimens: 陈靖邦 叶梓成 刘明锐	王 灿 Wang Can
	亚洲赛区金牌 Gold Medal in Asia Regional Contest	Reconquista: 陈诗翰 颜姜哲 蒋仕彪	
		Legilimens: 陈靖邦 叶梓成 刘明锐	
		LeatherClub: 王禹程 刘振威 王宇晗	
		RunTime=1000ms: 张瑜安 姜怡文 黄洋逸	
		Hephaestus: 贺思睿 李彦奎 刘睿	
	亚洲赛区银牌 Silver Medal in Asia Regional Contest	Hephaestus: 贺思睿 李彦奎 刘睿 Aftermath: 赵竟霖 唐小虎 彭自涵 SomeTeamsNaive: 郑鸿鹄 陈翰逸 王义泽	
	亚洲赛区铜牌 Bronze Medal in Asia Regional Contest	LeatherClub: 王禹程 刘振威 王宇晗 RunTime=1000ms: 张瑜安 姜怡文 黄洋逸 SomeTeamsNaive: 郑鸿鹄 陈翰逸 王义泽	
2017世界机器人大赛 The 21 th Robot World Cup (RoboCup 2017)	小仿人组亚军 Kid-Size Humanoid League 2 nd place	ZJUDancer: 潘雨粟 彭 勃 留 云 姜朝峰 黄淮扬 何梦佳 李诚辉 杨宇杰 梅文星 诸壮添	熊 蓉 周春琳 Xiong Rong, Zhou Chunlin
	小型组季军 Small Size League 3 rd place	ZJUNlct: 顾见洋 黄 利 杨 桐 王艳慧 方泽华 李佳诚 黄哲远 高天尧 吴亚楠 蒋颖麟	
2017国际机器人创意设计大赛 IDC Robocon 2017	第1名 1 st place	艾志强	王 酉 朱秋国 Wang You, Zhu Qiuguo
	第2名 2 nd place	张子昂	
	第3名 3 rd place	董 骁	
2017年世界机器人大赛 伊朗公开赛 2017 RoboCup Iran Open	小型组冠军 Small Size League 1 st place	杨 桐 黄 利 高天尧 黄哲远 王艳慧 方泽华 吴亚楠 李佳诚	熊 蓉 周春琳 Xiong Rong, Zhou Chunlin
	优胜奖 Winner	梅文星 兰云瀚 留 云 姜朝峰 潘雨粟 李诚辉 杨宇杰 彭 勃 何梦佳 黄淮扬	
2017 红点国际设计奖 Reddot Award 2017	小仿人组冠军 Kid-Size Humanoid League 1 st place	Quick Assembling Blind Tracks: 郑大巍 崔维健 李昱炜 金 琦 王子绶 DIY WEAVE: 郦家骥 陈 尧 张曹炜 张小恋 徐将依	张旭生 Zhang Xusheng 姚 琤 江 浩 Yao Cheng Jiang Hao
2017 iF国际学生设计奖 iF Student Design Award 2017	优胜奖 Winner	Linkinggreen: 徐文彬, 齐妹洁	徐雯洁 Xu Wenjie

海外交流

International Exchange and Cooperation

学部2017年教师出访参加学术会议、合作交流553人次，接待259人次国外学者来访进行学术交流，主办国际会议8次，接待斯蒂文斯理工学院、杜克大学等来访。学部各学院（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 2017, 553 persons visited abroad for academic exchange and cooperation. More than 259 world-renowned scholars were invited to visit FIT. Meanwhile, we successfully hosted about 8 international conferences and welcomed the delegations from Stevens Institute of Technology, Duke University, etc. The colleges of FIT continue to strengthen the international exchange and cooperation in order to 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	电磁场与多物理场建模高性能计算国际学术研讨会 International Workshop on High-Performance Computing for Electromagnetic and Multiphysics Modeling	May 11-13
2	第十四届光学与光子学教育及实践国际会议 The 14 th Conference on Education and Training in Optics and Photonics	May 29-31
3	第28届机器人设计大赛 IDC ROBOCON 2017	August 6-20
4	中美临床医疗大数据研讨会暨 OHDSI 中国工作组年会 China-US Healthcare Big Data Forum 2017 / OHDSI China Annual Workshop	August 21
5	第八届智能控制与信息处理国际会议 The 8 th International Conference on Intelligent Control and Information Processing	November 3-5
6	首届（西湖）半导体集成电路技术研讨会 The Semiconductor Integrated Circuit Technology Workshop 2017	November 6-9
7	“流程生产质量优化与控制”2017高峰论坛 Quality-targeted Process Optimization and Control Forum 2017	November 11-12
8	国际电气电子工程师学会先进封装系统电子设计会议 IEEE Electrical Design of Advanced Packaging Systems Symposium	December 14-16

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 Advisor
2017年中国大学生程序设计竞赛 China Collegiate Programming Contest (CCPC)	亚军 First Runner Up	Reconquista: 陈诗翰 颜姜哲 蒋仕彪	王 灿 Wang Can
	金牌 Gold Medal	Reconquista: 陈诗翰 颜姜哲 蒋仕彪	
		Legilimens: 陈靖邦 叶梓成 刘明锐	
		LeatherClub: 王禹程 刘振威 王宇晗	
	铜牌 Bronze Medal	Aftermath: 赵竟霖 唐小虎 彭自涵	
2017年全国大学生电子设计竞赛 2017 National Undergraduate Electronic Design Contest	一等奖 1 st place	陈乾豪 邹卓阳 刘培东	沈义民 Shenyimin
		王丙楠 李星辉 李 谦	阮秉涛 Ruanbingtao
	二等奖 2 nd place	张义然 孙怡琳 李凯洲	金向东 马洪庆 Jin Xiangdong, Ma hongqing
		夏天伦 钟 颖 罗 敏	阮秉涛 Ruanbingtao
第十四届浙江省大学生 程序设计竞赛 The 14 th Zhejiang Provincial Collegiate Programming Contest	特等奖 Grand Prize	金梦格 赵越奇 陈诗翰	王 灿 Wang Can
	一等奖 1 st place	颜姜哲 沈 滨 贺思睿 杨依霖 魏耀东 姜怡文	
	二等奖 2 nd Place	陈靖邦 彭自涵 叶梓成 张程易 张翔宇 张奋翔 鲁哲轩 段亦超 李彦奎	

专项奖 Special Awards

奖项 Award	获奖学生 Winners	学院 College of
2016-2017学年浙江大学 竺可桢奖学金 Chu Kochen Scholarship	苏凯麒 Su Kaiqi	生物医学工程与仪器科学学院 Biomedical Engineering & Instrument Science
	姜 鑫 Jiang Xin	信息与电子工程学院 Information Science and Electronic Engineering
	李梦圆 Li Mengyuan	信息与电子工程学院 Information Science and Electronic Engineering
	周君沛 Zhou Junpei	计算机科学与技术学院 Computer Science and Technology

2017要闻

News 2017

1月12日，浙江大学医工信结合交流平台正式启动，信息学部与医学部通力合作促进学科交叉融合，光电学院刘旭教授作会议主题报告

On Jan.12th, the communication platform was officially launched to promote the interdisciplinary integration between FIT and CMM. Prof. Liu Xu from OSE College was invited to deliver the keynote speech.



3月16日出版的Nature对信息学部进行了专题报道“Faculty of Information Technology: A hub of information technology (Vol.543, No.7645)”，文章共有7页，全面展示了信息学部的辉煌历史、学科特色、领衔研究优势和生产生活领域的重要社会贡献等

On Mar.16th, Nature published a special report on FIT: A hub of information technology (Vol. 543, No. 7645).

3月16日，信息学部召开2017年度工作会议，总结2016年度工作，商议2017年工作思路

On Mar.16th, FIT held the annual work conference to sum up the work in 2016 and discuss the major tasks in 2017.



5月11日，浙江大学研究生院发文（浙大研院〔2017〕7号）成立“信息+X”多学科交叉人才培养中心，该中心由信息学部牵头组建

On May 11th, “Information plus X” Interdisciplinary Talents Training Center was set up in FIT.

浙江大学研究生院文件

浙大研院〔2017〕7号

浙江大学研究生院关于开展“多学科交叉人才培养卓越中心”建设试点工作的通知

5月12-16日，信电学院徐文教授课题组在南海出色完成了迄今为止国内成功进行的工作海域最深、回坞成功次数最多的水下回坞海上试验

On May.12th-16th, the group led by Prof. Xu Wen from ISEE College has accomplished underwater docking in South China Sea, which has been the most successful sea trial in China.



6月22-24日，由中美两国工程院共同主办的“2017中美工程前沿研讨会”在同济大学举行，控制学院许超副教授与生仪学院许迎科副教授竞争选拔成功入选大会报告和墙报展示

On Jun.22th-24th, Assoc. Prof. Xu Chao and Xu Yingke were elected to conference report and poster presentation in the China-America Frontiers of Engineering Symposium 2017 (CAFOE).



36



12月14-16日，第14届IEEE先进封装系统电子设计国际学术会议在浙江大学海宁国际校区举办，信电学院李尔平教授和尹文言教授分别担任会议共同主席

During Dec.14th-16th, IEEE Electrical Design of Advanced Packaging & Systems Symposium 2017 was held successfully in International Campus, ZJU. Both Prof. Li Erping, vice dean of FIT, and Prof. Yin Wenyan from ISEE College were selected as the general co-chair of the Symposium.



计算机学院鲍虎军教授荣获2017年CCF王选奖

Prof. Bao Hujun from CS college, the dean of FIT, was honored as CCF Wang Xuan Award 2017.

控制学院机器人专家熊蓉获全国五一巾帼奖章

Prof. Xiong Rong, a roboticist from CSE College, won the National May Day Women's Medal.



信电学院赵民建教授获唐立新优秀学者奖，光电学院冯华君教授获永平教学贡献提名奖，控制学院张光新教授获宝钢优秀教师奖

Prof. Zhao Minjian from TSEE won Tang Lixin Excellent Scholar Award. Prof. Feng Huajun from COSE won Nominated Yongping Teaching Contribution Award. Prof. Zhang Guangxin from CSE won Baogang Excellent Teacher Award.



光电学院罗明教授在国际颜色协会2017大会上被授予AIC Judd Award 学术成就奖

Prof. Luo Ming was awarded the AIC Judd Award for academic achievement in the 2017 International Colour Association (AIC).

