浙江大學信息學部

FACULTY OF INFORMATION TECHNOLOGY, ZHEJIANG UNIVERSITY

浙江大學 信息學部

AnnualReport 2022

FACULTY OF INFORMATION TECHNOLOGY
ZHEJIANG UNIVERSITY

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励动设计 · 铭致同心品牌机构 Tel. 13605819891

浙江大學信息學部

Faculty of Information Technology
Zhejiang University

Annual Report 年报 2022

学部概况 Introduction to FIT

信息学部涵盖了光电科学与工程学院（光电学院）、信息与电子工程学院（信电学院）、控制科学与工程学院（控制学院）、计算机科学与技术学院（计算机学院）、网络空间安全学院（网安学院）、软件学院、生物医学工程与仪器科学学院（生仪学院）、微纳电子学院。学部共有13个本科专业，11个一级学科，其中光学工程、控制科学与工程、计算机科学与技术、软件工程入选国家“双一流”建设学科名单，这四个学科也被教育部评为A+学科。学部拥有5个全国重点实验室，1个国家工程实验室，3个国家工程（技术）研究中心，共有26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 seven colleges, namely College of Optical Science and Engineering (COSE), College of Information Science and Electronic Engineering (ISEE), College of Control Science and Engineering (CSE), College of Computer Science and Technology (CCST)，including College of Cyber Science and Technology (CCST)), College of Biomedical Engineering and Instrument Science (BME), College of Software Technology (CST) and College of Micro-Nano Electronics (CMNE). Currently, FIT has 13 undergraduate programs and 11 primary disciplines, in which there are 4 disciplines both assessed as A+ by MOE and constructed as National "Double First-Class" discipline, they are Optical Engineering, Control Science and Engineering, Computer Science and Technology, and Software Engineering. There are 5 State Key Laboratories, 1 National Engineering Laboratory, 3 National Engineering Research Centers, 26 research institutes, to devote to the innovation research on information science and technology.

主任：陈　纯
Dean : Chen Chun

副主任：李尔平
Vice-Dean : Li Erping

副主任：邱建荣
Vice-Dean : Qiu Jianrong

2022

ANNUAL REPORT

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Organization

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- 主 任 陈 纯 副主任 李尔平 庄越挺
- 委 员 尹建伟 匡翠方 任 奎 刘 东 孙凌云 杨建义 时尧成 吴 飞 吴汉明 邱建荣 张 宏 张朝阳 陈 刚 陈红胜 陈积明 陈耀武 邵之江 赵民建 章献民 程 鹏 鲍虎军 熊 蓉 潘 纲 戴道锌

Academic Committee

- **Director** Chen Chun
- **Vice Director** Li Erping Zhuang Yueting
- **Committee members**
  Yin Jianwei Kuang Cuifang Ren Kui Liu Dong
  Sun Lingyun Yang Jianyi Shi Yaocheng Wu Fei
  Wu Hanming Qiu Jianrong Zhang Hong Zhang Zhaoyang
  Chen Gang Chen Hongsheng Chen Jiming Chen Yaowu
  Shao Zhijiang Zhao Minjian Zhang Xianmin Cheng Peng
  Bao Hujun Xiong Rong Pan Gang Dai Daoxin

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- 委 员 刘 东 刘华锋 孙凌云 吴 飞 张朝阳 陈 曦 陈 为 陈积明 周 泓

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- **Vice Director** Chen Hongsheng Ren Kui
- **Committee members**
  Liu Dong Liu Huafeng Sun Lingyun Wu Fei
  Zhang Zhaoyang Chen Xi Chen Wei Chen Jiming
  Zhou Hong

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- **Committee members**
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  Yang Zongyin Lin Xiao Lin Hui Lin Feng Zhuo Cheng
  Xu Yang

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- **Committee members**
  Wang Xiaosong Liu Qingjun Xu Zhengping Sun Shouqian
  Wu Yingcai Li Chunguang Xiao Jun Shi Yaocheng
  He Xiangning Chen Hongsheng Shao Zhijiang Zhou Hong
  Zhao Daomu Huang Zhiyao Tong Limin Yu Xiaopeng

学部学院 COLLEGE OF

师资队伍
Talent Team

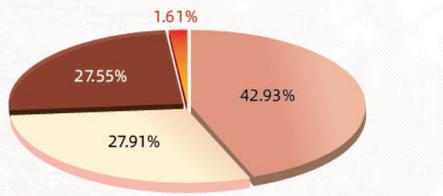
学部教职员工823人，其中教学科研岗559人。现有中国工程院院士5人，中国科学院院士1人，国家百千万人才工程人选9人，教育部高校教学名师1人，国家杰出青年基金获得者25人，优秀青年基金获得者22人，浙江省特级专家8人。国家自然科学基金创新群体2个，教育部创新团队2个。

2022年，12位教师入选国家级高层次人才计划，其中国家杰出青年基金获得者1人，国家优秀青年基金获得者4人。1位教师获浙江省有突出贡献中青年专家称号，2位教师评聘为长聘教授，3位教师评聘为长聘副教授。5位教师晋升教授，3位教师晋升副教授。引进教师40人，其中预聘制教师33人。

FIT has 823 full-time faculty and staff members, including 559 faculty members. There are 5 members of Chinese Academy of Engineering and 1 member of Chinese Academy of Sciences, 9 professors of National Bai-Qian-Wan Talent Project, 1 Outstanding Teacher in Universities of MOE, 25 National Distinguished Youth Science Foundation Fellows, 22 National Excellent Youth Science Foundation Fellows, 8 Zhejiang Provincial Outstanding Experts, 2 Innovative Research Groups of NSFC and 2 Innovative Research Teams of MOE.

In 2022, 12 professors were selected into the national talent programs, including 1 winner of National Science Fund for Distinguished Young Scholar, and 4 winners of National Science Fund for Excellent Young Scholar. 1 professor was honored with Zhejiang Province Outstanding Achievement Youth Expert. 5 faculty members had got their tenure. 5 teachers were promoted to full professor and 3 teachers were promoted to associate professor. 40 new faculty members joined FIT.

教学科研队伍职称结构
Professional Structure



2022年新增 Awarded in 2022

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

童利民
Tong Limin

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

李玺
Li Xi

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

马耀光
Ma Yaoguang

王作佳
Wang Zuojia

赵 洲
Zhao Zhou

丁 肃
Ding Nai

长聘教授
Tenured Professor

许威威
Xu Weiwei

吴 丹
Wu Dan

长聘副教授
Tenured Associate Professor

陈晓明
Chen Xiaoming

黄科杰
Huang Kejie

潘 宇
Pan Yu

教授
Professor


赵 洲
Zhao Zhou

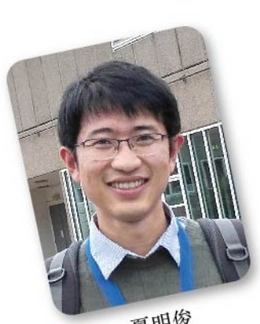

叶德信
Ye Dexin

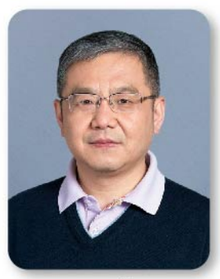

田 翔
Tian Xiang


王 灿
Wang Can


张培勇
Zhang Peiyong

副教授
Associate Professor


夏明俊
Xia Mingjun


阮 伟
Ruan Wei


Pintu Ghosh

引进教师 New Faculty Member

蔡 晗 Cai Han	蔡声泽 Cai Shengze	曹雨齐 Cao Yuqi	柴 利 Chai Li	陈 昊 Chen Hao	陈佳伟 Chen Jiawei	公培军 Gong Peijun	郭 敏 Guo Min
黄 进 Huang Jin	金日成 Jin Richeng	李晨晖 Li Chenhui	李高峰 Li Gaofeng	李 亮 Li Liang	李 硕 Li Shuo	李 松 Li Song	李云龙 Li Yunlong
林 励 Lin Li	林子暄 Lin Zixuan	卢丽强 Lu Liqiang	罗 梦 Luo Meng	罗 威 Luo Wei	沈浩颋 Shen Haoting	舒元超 Shu Yuanchao	王海帅 Wang Haishuai
王小航 Wang Xiaohang	魏 凯 Wei Kai	杨 坤 Yang Kun	杨照辉 Yang Zhaohui	姚培森 Yao Peisen	尤伟涛 You Weitao	张 聪 Zhang Cong	张 梦 Zhang Meng
张明雪 Zhang Mingxue	张时远 Zhang Shiyuan	张运炎 Zhang Yunyan	郑飞君 Zheng Feijun	郑 乾 Zheng Qian	朱霖潮 Zhu Linchao	邹常青 Zou Changqing	

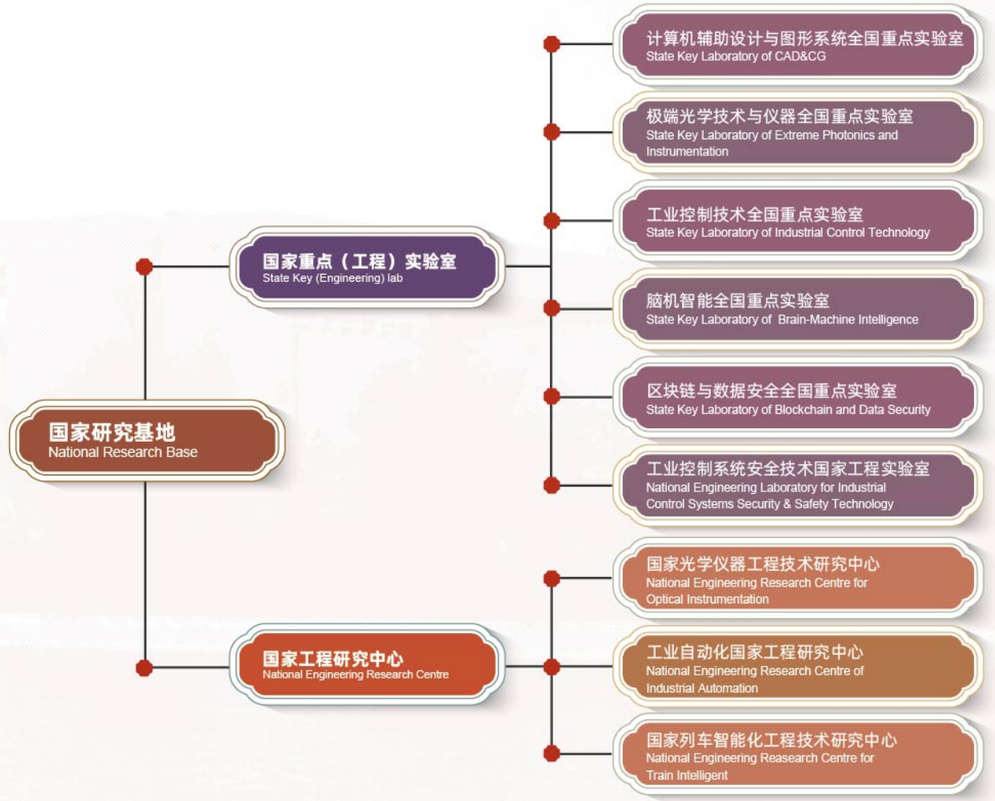
Srikrishna Chanakya Bodepudi

科学研究
Scientific Research

2022年度财务到校科研经费逾13亿，纵向占比63%（含军工），其中国家自然科学基金共获批84项，合计经费7800万元，包含杰青1项，优青4项，重大重点等共20项。被SCI收录论文逾1100篇，其中高水平论文超67%，已获授权发明专利490项。新增全国重点实验室2个，获浙江省科技奖一等奖共7项。学部2022年教师出访参加学术会议、合作交流共164人次，约接待130人次国外学者来访进行学术交流，主办国际会议8次。

In 2022, the total research funding of FIT reached over 1300 million RMB. 84 grants with the amount up to 78 million RMB were approved by the National Natural Science Foundation of China (NSFC), including 1 project for distinguished young scholars, 4 projects for excellent young scholars and 20+ vital important projects. 1100+ papers were indexed by SCI and 490+ national patents have been approved this year. Several projects achieved significant progress such as the 1st Prize of Zhejiang Provincial Awards for Science & Technology (Sci. & Tech) . Furthmore, 2 National Key Laboratories was approved in 2022. More than 164 persons visited abroad for academic exchange and cooperation. About 130 world-renowned scholars were invited to visit FIT. Meanwhile, we successfully hosted 8 international conferences.

国家研究基地 National Research Base



研究所 Institute

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
	光学成像与检测技术研究所 Inst. of Optical Imaging and Detection Technology	徐之海 Prof. Xu Zhihai
	光学惯性技术工程中心 Center for Optical Inertial Technology	黄腾超 Prof. Huang Tengchao
	光电工程研究所 Inst. of Optical and Photonical Engineering	匡翠方 Prof. Kuang Cuifang
	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
	微纳光子学研究所 Inst. of Microphotonics and Nanophotonics	邱建荣 Prof. Qiu Jianrong
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
	微电子集成系统研究所 Inst. of Integrated Microelectronic Systems (IMS)	储 涛 Prof. Chu Tao
微纳电子学院 Micro-Nano Electronics	超大规模集成电路设计研究所 Inst. of VLSI Design	黄 凯 Prof. Huang Kai
	先进集成电路制造技术研究所 Inst. of Advanced IC Manufacturing Technology	高大为 Prof. Gao Dawei
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	陈积明 Prof. Chen Jiming
	智能感知与检测研究所 Inst. of Smart Sensing and Measurement	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
	工业智能与系统工程研究所 Inst. of Industry Intelligence and Systems Engineering	陈 曦 Prof. Chen Xi
	控制装备及综合安全研究所 Inst. of Control Equipment and Comprehensive Safety	王文海 Prof. Wang Wenhai
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	潘 纲 Prof. Pan Gang
	现代工业设计研究所 Inst. of Modern Industrial Design	孙凌云 Prof. Sun Lingyun
生物医学工程与仪器科学学院 Biomedical Engineering and Instrument Science	生物医学工程研究所 Inst. of Biomedical Engineering	刘清君 Prof. Liu Qingjun
	数字技术及仪器研究所 Inst. of Digital Technology and Instrument	周 凡 Prof. Zhou Fan
	医疗健康信息工程技术研究所 Inst. of Medical and Health Information Engineering	叶学松 Prof. Ye Xuesong
	生物医学影像研究所 Inst. of Biomedical Imaging	徐晓音 Prof. Xu Xiaoyin

科研亮点 Research Highlight

1.学部个推青年创新奖 Youth Innovation Award

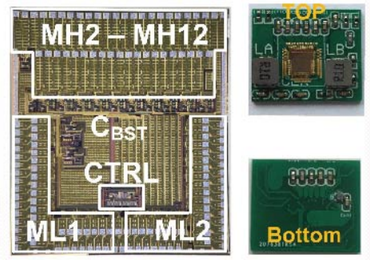
屈万园
副教授
微纳电子学院

研究方向： 电源管理芯片设计

简介： 在面向处理器的高密度电源管理芯片设计领域，分别提出48V/12V/5V三大主流应用领域的高密度高效率混合型开关电源架构，并分别突破传统技术路线的供能密度与效率瓶颈。相关工作连续三年发表于集成电路设计领域最高水平会议国际固态电路会议，并获评国际固态电路会议2021年丝绸之路奖、国际固态电路会议2022年电源管理亮点论文。

Power Management Integrated Circuit Design

With respect to the high-density power management integrated circuit design for processors, the researcher Qu has proposed three hybrid switching-mode power supply architectures for the 48V/12V/5V mainstream application domains, and made meaningful breakthroughs on the converter power density and efficiency. The related work has been published to the most prestigious conference on the integrated circuit field, the IEEE International Solid-State Circuit Conference (ISSCC), and awarded the ISSCC 2021 Silkroad Award and the ISSCC 2022 "DC-DC Converter" highlight paper, respectively.



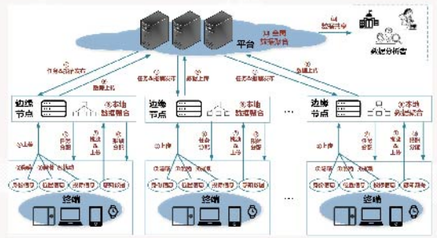
王志波
教授
计算机学院

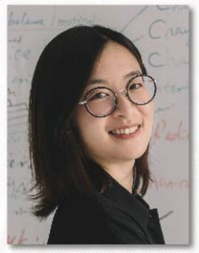
研究方向： 泛在可信智能物联网

简介： 提出了首个隐私保护的群智感知系统框架，构建了云边端协同的安全智能计算框架与方法，揭示了复杂对抗环境中系统服务的脆弱性并研制了智能系统安全验证与评测平台，推进了智能物联网"感知–计算–服务"全过程可信可用。主持国家优青、联合基金重点等多项国家级项目，研究成果被雅虎、科学网等国内外媒体广泛报道，入选浙江省科协代表性成果，应用于华为、阿里、浪潮等头部企业。

Trustworthy Intelligent Internet of Things（IoT）

Prof. Wang has proposed the first privacy-preserving crowd sensing framework and developed a system security verification and evaluation platform. His academic achievements have promoted the trustworthiness and availability throughout the whole process of "perception-computation-service" for intelligentIoT. He has engaged in multiple national-level projects such as the NSFC for Excellent Young Scholars. His research results have been widely reported by media including Yahoo & ScienceNet. The proposed technologies have been applied to top enterprises such as Huawei, Alibaba, etc.





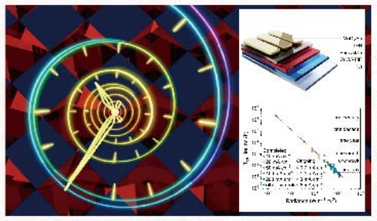
赵保丹
研究员
光电学院

研究方向： 新型半导体光电子器件

简介： 师从剑桥大学光电器件物理权威卡文迪许物理学教授Richard Friend院士，在Nature Photonics，Nature Electronics，Advanced Materials等期刊发表多篇高水平论文。她两次刷新钙钛矿LED的效率纪录，最近与合作者利用一种双极性分子稳定剂，实现了超长寿命的钙钛矿LED，消除了对钙钛矿器件本征稳定性的疑虑，为新技术步入实际应用奠定基础。获《麻省理工科技评论》中国区“35岁以下科技创新35人”、阿里巴巴达摩院青橙奖、福布斯中国等多项荣誉。

Emerging Semiconductor Optoelectronics

The researcher Zhao was supervised by Prof. Sir Richard H. Friend, the Cavendish Prof. of Physics in the University of Cambridge, UK. Her research results have been published in top academic journals including Nature Photonics, Nature Electronics, and Advanced Materials, etc. She has created efficiency records for perovskite LEDs. Recently, together with her collaborator, she has progressed in removing the critical concern that halide perovskite devices may be intrinsically unstable, paving the path towards real-world applications. Owing to her contributions to the field of perovskite optoelectronics, she has received many awards including MIT Technology Review "Innovators Under 35, China" , Damo Academy Young Fellow, Forbes Under 30 China.



2.学部光谷成果转化奖 | Achievement Transformation Award

金小刚
教授
计算机学院

获奖成果： 具有自主知识产权的三维服装设计工业软件研发及其产业化

简介： 纺织服装产业是我国的传统优势产业和支柱产业。虽然中国是世界上最大的服装生产国和出口国，但在三维服装设计基础工业软件方面严重依赖进口。金小刚教授团队攻克了服装CAD设计与建模、实时高分辨率布料仿真、服装高逼真实时绘制等一系列理论难题，研发了国内首个商业化三维服装设计CAD软件Style3D，提供了从3D设计开始到直连生产的全流程数字化解决方案，在阿里巴巴、百度、波司登、北京服装学院等上千家企业和高校进行商业应用，新增产值上百亿，大幅度提升了服装的设计效率和智能化水平，有效地支持了尤其是疫情期间的国家经济发展。

3D Garment Design Industrial Software R&D and Industrialization with Independent Intellectual Property Rights

Style3D is the first domestically commercialized 3D clothing design CAD software. The project directed by Prof. Jin Xiaogang from CCST offered a full-process digital solution ranging from 3D design, push and review, 3D revision, intelligent price verification, automatic BOM, light customization, virtual showroom, and direct production. It has been commercially applied in thousands of enterprises and universities, including Alibaba, Baidu, Bosideng and the Beijing Institute of Fashion Technology, and the new output value has reached tens of billions, greatly improving the design efficiency and intelligence level of clothing and supporting the country's economic development during the epidemic.

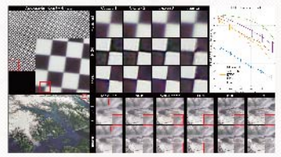
冯华君
教授
光电学院

获奖成果： 移动端成像系统的像质提升技术突破性进展及应用

简介： 在移动端成像不断发展的今天，手机摄影已经代替专业相机成为了人们获取图像的主要手段，但手机成像系统一直存在无法完全避免光学像差和加工偏差带来的退化问题。冯华君/徐之海教授团队自2014年开始攻坚移动端成像系统，指导博士生陈世錡等提出了基于深度学习的计算光学方法矫正成像系统的光学像差，完满解决光学设计像差及加工误差带来的像质退化难题。在大规模制造的移动成像系统中全部实现了接近衍射极限的像质提升，成果在国内顶级公司的旗舰产品中落地应用，被公司认可为“业界顶级”和产品的“重要卖点”，生动诠释了把论文写在祖国大地上的时代精神与风貌。

Breakthrough Progress and Application of Image Quality Improvement Technology in Mobile Imaging System

The team of Prof. Feng and Prof. Xu began to explore the mobile imaging system since 2014. Their Doctoral student Chen Shiqi etc. proposed a method of computational optics to correct the optical aberration of the imaging system, and solved the problem of random processing deviation during mass production, and fully solved the problem of image quality degradation caused by optical design aberrations and manufacture processing errors. In the large-scale manufacturing of mobile imaging system, the image quality close to the diffraction limit has been improved, and the achievements have been applied in the flagship products of mobile phone manufacturer, recognized by the head enterprise as the "top in the industry" and the "important selling point" of the products.



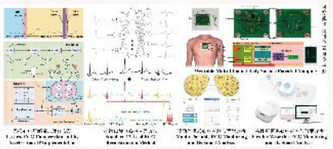
潘 赟
副教授
信电学院

获奖成果： 多场景多模态移动心电监测技术与器械创新及应用

简介： 创新移动医疗装备研发、生产及产业链安全可控对我国顺利实施健康中国战略至关重要。潘赟副教授团队面向患者基数大、健康危害重的心血管疾病，开展“小型化”、“智能化”先进移动心电医疗装备全链技术研发，突破结合症状驱动与长程连续的多场景多模态医疗级移动心电监测关键技术核心瓶颈，主持设计的移动便携式与穿戴式医疗器械实现大规模工业化量产，获批4项国家二类医疗器械证书并投入市场，主持的两部委“人工智能医疗器械创新任务揭榜项目”已进入三类器械多中心大规模临床试验，相关成果获浙江省科技进步三等奖，新增应用量超百万人群，取得显著的社会与经济效益。

Innovation and Application of Multi-Scenario and Multimodal Mobile ECG Monitoring Technology and Equipment

Associate Prof. Pan's team carried out the full-chain technology of "miniaturized" and "intelligent" advanced mobile ECG medical equipment for cardiovascular diseases with a large number of patients and great health hazards. He has broke through the core bottleneck of key technologies of daily medical ECG monitoring combined with symptom-driven and long-term continuous modes, realized the design and manufacture of medical grade miniaturized multi-scenario and multimodal mobile ECG monitoring equipment. He has chaired the design of mobile portable and wearable medical devices to achieve large-scale industrial mass production, of which 4 novel devices were approved Class II national medical device certificates and put into the market. He has also won the third prize of Zhejiang Provincial Sci. & Tech Progress Award.



3.新增国家科研基地 | New National Research Base

脑机智能全国重点实验室

实验室于2022年5月获批，被列入首批20所全国重点实验室。实验室主任为吴朝晖院士，首席科学家为段树民院士，学术委员会主任为李德毅院士。实验室面向国家重大需求，做有组织科研，聚焦脑与机的交互、融合、模拟、增强的科学问题与技术难题，拟重点突破脑机神经基础、脑机信息读写、脑机智能建模、脑机融合增强等基础理论与技术。实验室会聚了多个优势学科科研力量组成的100多位学科交叉科研队伍，拟将实验室建设成为世界一流、具有重要国际影响力的科研高地。

The National Key Laboratory of Brain-Machine Intelligence

The Laboratory was established in May 2022. The laboratory plans to focus on breakthroughs in fundamental theories and technologies such as brain-machine neuroscience, brain-machine information I/O, brain-machine intelligence modeling, and brain-machine augmentation. The laboratory brings together research forces from multiple advantageous disciplines of ZJU, forming an interdisciplinary research team of over 100 people. The director of the laboratory is Academician Wu Zhaohui, the chief scientist is Academician Duan Shumin, and the academic committee director is Academician Li Deyi. The laboratory aims to become a world-class research institute with significant international influence.

区块链与数据安全全国重点实验室

实验室于2022年11月份获批，陈纯院士担任实验室主任，任奎教授、陈刚教授和杨小虎教授担任实验室副主任，吴建平院士担任实验室学术委员会主任。实验室聚焦区块链与数据安全科技前沿，建设国家战略科技力量，构筑国家技术竞争新优势，实现我国区块链与数据安全技术高水平自立自强。坚持“四个面向”，产学研融合发展，赋能数字经济高质量发展，促进国家治理体系和能力现代化建设。

The National Key Laboratory of Blockchain and Data Security

The laboratory was approved in November 2022, with Chinese Academy of Engineering (CAE) member Chen Chun as the director, and Prof. Ren Kui, Prof. Chen Gang, and Prof. Yang Xiaohu as the vice directors, and CAE member Wu Jianping as the director of the academic committee. The lab focuses on the forefront of blockchain and data security technology, aiming to build national strategic scientific and technological capabilities, construct new national technological advantages, and achieve high-level self-reliance in blockchain and data security technology in China. The lab adheres to the "four orientations" and promotes the integration of industry, academia, and research to empower the high-quality development of the digital economy and promote the modernization of the country's governance system and capacity.

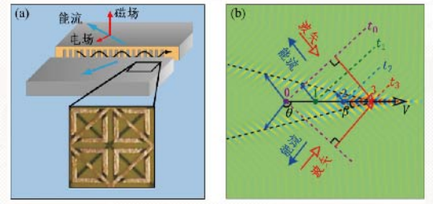
4.重大科研成果及进展 | New Important Projects and Significant Progress

① 人工电磁材料中逆切伦科夫辐射的发现及机理

信电学院陈红胜教授领衔的该项目获2022年浙江省自然科学奖一等奖。项目提出了负折射率人工电磁材料设计的新思路，于2009年实验发现了逆切伦科夫辐射，2018年揭示了人工电磁材料中渡越辐射共振产生逆切伦科夫辐射的新机理，为开展逆切伦科夫辐射实验研究奠定了材料基础和理论基础。代表论文发表在Nature Physics、PRL等期刊上；逆切伦科夫辐射研究成果被APS Physics等科技网站广泛报道，入选PRL编辑推荐，被麻省理工学院物理系课程选为经典参考文献。

Experimental and Theoretical Studies of Inverse Cherenkov Radiation from Metamaterials

This project, led by Prof. Chen Hongsheng from ISEE, won the first prize of Zhejiang Provincial Natural Science Award. First, this project proposed a route to implement metamaterials with a negative refractive index. Second, this project discovered the inverse Cherenkov radiation in experiments in 2009. Third, this project revealed a mechanism to achieve the inverse Cherenkov radiation by exploiting the resonance transition radiation inside the metamaterials. These significant findings, which could lay the material foundation for the experimental study of inverse Cherenkov radiation, have been published on high-profile journals, such as Nature Physics and PRL. Particularly, the findings about the inverse Cherenkov radiation have been widely reported by renowned websites (e.g., APS Physics), highlighted by PRL editors, and also selected as classic references by courses in Department of Physics at MIT.



② 复杂数据的可视表达与交互可视分析的基础理论与方法

计算机学院陈为教授领衔的该项目获2022年浙江省自然科学奖一等奖。项目首次揭示了可视分析与机器学习在高维数据的几何表达上的关联性。设计了可保持高维几何结构的无监督特征选择模型，构建了保持内在高维几何结构的可视分析新模式，系统性地提出了探索式可视分析新流程，创新了交互分析和推理复杂事件的范式。8篇代表作WOS他引1085次，被11位院士和图灵奖得主、50余位ACM/IEEE Fellow肯定。

Basic Theories and Methods for Visual Representation and Interactive Visual Analytics of Complex Data

This project, led by Prof. Chen Wei from CCST, won the first prize of Zhejiang Provincial Natural Science Award in 2022. This project reveals the relevance of visual analytics and machine learning on geometric representation of high-dimensional data for the first time. An unsupervised feature selection model that can maintain high-dimensional geometric structure is designed, and a new visual analytics method that maintains intrinsic high-dimensional geometric structure is constructed. This project systematically proposes a new pipeline for exploratory visual analytics, and innovates a paradigm for interactive analysis and complex events reasoning. Eight representative works have been positively recognized by 11 academicians and Turing Award winners, and more than 50 ACM/IEEE Fellows.

③ 单目视觉鲁棒跟踪定位的理论和方法

计算机学院鲍虎军教授领衔的该项目获2022年浙江省自然科学奖一等奖。项目系统深入地开展了单目视觉跟踪定位的理论和方法的研究，创新提出了先验学习和统计优化的思想，突破了单目相机跟踪定位与建图、目标检测跟踪、物体与人体位姿估计等关键技术，显著提升了实际复杂环境下单目视觉跟踪定位的精度、效率和稳定性，算法的性能和指标达到了国际先进水平。有关研究成果得到了广泛引用和高度评价，以及成功应用，推动了我国视觉智能研究水平和相关产业发展。

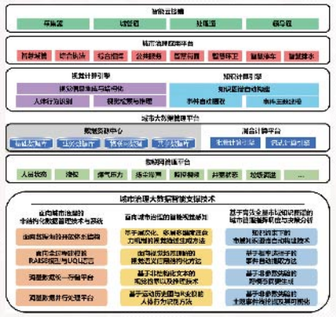
Theory and Methods of Robust Monocular Visual Tracking and Localization

This project, led by Prof. Bao Hujun from CCST, won the first prize of Zhejiang Provincial Natural Science Award in 2022. The project systematically carried out research on the theory and methods of monocular visual tracking and localization. Based on the core idea of prior learning and statistical optimization, the project developed a series of methods to solve the challenging problems including monocular camera tracking and mapping, object detection and tracking, and object and human pose estimation, significantly improving the accuracy, efficiency, and stability of monocular visual tracking and localization in practical complex environments and achieving the state-of-the-art performance. The proposed methods have been successfully applied. The project has pushed forward the development of China's visual intelligence research and related industries.

④ 城市治理大数据智能关键技术及应用

计算机学院庄越挺教授领衔的该项目获2022年浙江省科学技术进步奖一等奖。项目研发面向城市治理的非结构化数据管理技术与系统，在800多个城市应用，使数据治理、分析建模和模型共享所需的时间从周缩短到小时。研发面向城市治理的智能视觉感知技术，面向城市治理领域80类场景，算法平均准确率高于同类产品10%；研发基于高效全量市域知识图谱的城市治理指挥调度与决策分析技术，在千万级人口城市中实现了10亿级以上市域图谱构建。成果在浙江、安徽等全国20多个省份得到广泛应用，社会经济效益显著。

Key Technologies and Applications of Big Data Intelligence for Urban Governance



This project, led by Prof. Zhuang Yueting from CCST, won the first prize of Zhejiang Provincial Sci & Tech Progress Award in 2022. The project addresses three major challenges. Concretely, it develops non-structured data management technology and systems specifically, and intelligent visual perception technology, which covers 80 types of urban scenarios and achieves 10% higher than similar products in terms of average accuracy. Besides, it develops city governance command and decision analysis technology based on an efficient full-scale city knowledge graph in cities with populations of tens of millions. This accomplishes the construction of a city-level graph with more than one billion entities and relationships. Its achievements have been widely applied in urban governance departments in more than 20 provinces of China, which creates significant social and economic benefits.

⑤ 复杂环境下物流巡检机器人感知与控制关键技术及产业化应用

控制学院刘勇教授领衔的该项目获2022年浙江省科学技术进步奖一等奖。项目突破了复杂作业环境下物流巡检机器人智能感知算法、单元算力硬件加速、高可靠硬件集成三大关键技术，开发了机器人核心感知与控制单元模块，已完全实现了产业化并取得了良好的经济效益。研发的高性能感控单元填补了国内空白，有效支撑了国防军工、港口枢纽、能源电力等国家关键行业的重大需求。

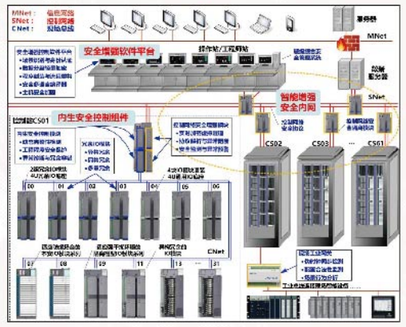
Key Technology and Industrial Application of Perception and Control for Logistics Patrol Robot in Complex Environment

The project, led by Prof. Liu Yong from CSE, won the first prize of Zhejiang Provincial Sci & Tech Progress Award in 2022. The project has achieved significant breakthroughs in logistics patrol robots' critical challenges in complex environments, including intelligent perception algorithms, unit computational power hardware acceleration, and high-reliability hardware integration. Meanwhile, the robot's core perception and control unit module have been developed resulting in full industrialization and good economic benefits. Especially, the developed high-performance perception and control unit has filled the gap in China and efficiently provided essential support for significant needs of the nation, such as military industry, port hubs, energy and power, etc.

⑥ 工控系统全生命周期内生安全主动防御大平台

控制学院王文海研究员领衔的该项目获2022年浙江省科学技术进步奖一等奖。项目提出了工控装置内生安全架构设计与规范，建立了首个工控系统全生命周期全流程攻防模型；实现了工程应用程序的全生命周期安全完整性技术；研制了工控系统内生安全主动防御大平台及系统4套；基于平台研制的国际首套内生安全关键控制系统，通过SIL3/SC3功能安全认证；社会经济效益显著。

Proactive Defense Platform for Endogenous Security in the Whole Life Cycle of Industrial Control System



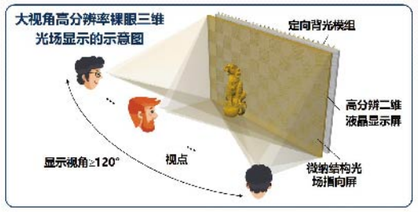
This project, led by Prof. Wang Wenhai from CSE, won the first prize of Zhejiang Provincial Sci.& Tech Progress Award in 2022. The project has broken through the key technologies such as threat situation awareness and anomaly detection, behavior monitoring and security enhancement, endogenous security and proactive defense of industrial control system, and formed a core technology system and proactive defense platform to ensure the endogenous security of industrial control system throughout its life cycle. Meanwhile, four sets of endogenous security proactive defense platforms and systems in industrial control system have been developed. The world's first endogenous security key control system, developed based on the platform, has passed SIL3/SC3 functional safety certification.

7 裸眼3D显示核心光学器件研究和开发

光电学院刘旭教授负责的该项目获批科技部国家重点研发计划资助。项目聚焦于新一代大视场、高分辨、高性能裸眼三维显示，致力于建立我国自主的裸眼三维光场显示体系，从裸眼三维显示系统光学元件的设计、高密度大信息量显示屏的制备与驱动、高精度微纳光场调控模组的制备技术与设备，到裸眼三维显示器组成与典型示范应用，有望形成我国对裸眼三维显示领域的全产业链自主可控。

Research and Development of Key Optical Components of High-Performance Naked Eye 3D Display

The project, led by Prof. Liu Xu from COSE, was supported by the MOST Key Research and Development Program. This project focuses on the new generation of large-field, high-resolution, high-performance naked eye 3D display. It aims to establish our own independent naked-eye 3D light field display systems, from the design of advanced optical elements of the naked-eye 3D display system, the fabrication of high-density and large-information display screen, the production technology and equipment of high-precision micro-nano light field control module, to the assembly and typical demonstration application of the naked-eye 3D display. This project will form our own independent control of the entire industrial chain in the field of naked-eye 3D display.



8 自主无人系统的开放通用高端智能控制器

控制学院熊蓉教授负责的该项目获批2022年“科技创新 2030—新一代人工智能”重大项目资助。项目聚焦于研制自主可控的开放通用高端智能控制器，在海陆空3类5种跨域异构自主无人系统上集成验证，将有效促进现有自主无人系统控制器从专用向通用发展，极大地降低我国自主无人系统发展的卡脖子风险。

Open Universal High-Grade Intelligent Controller for Autonomous Unmanned Systems

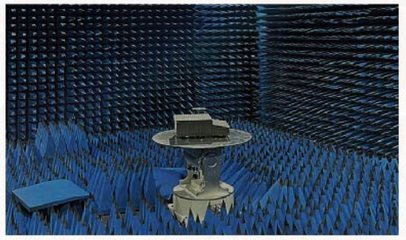
The project, led by Prof. Xiong Rong from CSE, was supported by the "Sci. &Tech Innovation 2030 - New Generation AI" major program in 2022. An open and universal high-grade intelligent controller with independent intellectual property rights will be designed by breaking through key technologies. The versatility and applicability of the developed controller will be verified on five types of cross-domain heterogeneous autonomous unmanned systems, which covers all 3 application scenarios of land, sea and air. The project will effectively promote the controllers of autonomous unmanned system from dedicated to general-purpose and significantly reduce the risk in the development of China's autonomous unmanned systems.

9 新一代人工智能电磁隐身斗篷关键技术

信电学院陈红胜教授负责的该项目获批2022年浙江省重点研发计划资助。项目聚焦隐身系统中实时感知设计、可重构电磁散射设计、散射特征综合优化、智能隐身芯片设计等，建立自适应电磁隐身系统设计方法学，重点突破低RCS、宽带响应、毫秒级响应以及与背景环境匹配相似度等难题，显著提升雷达探测下目标物体实时自适应电磁隐身能力，以推动隐身技术在安防、电磁基建、智能军事等两用产业的示范应用。

Key Technologies of Novel AI Based Electromagnetic Cloak

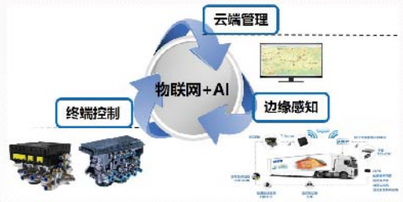
The project, led by Prof. Chen Hongsheng from ISEE, was supported by the Key R&D Program of Zhejiang Province in 2022. The project focuses on the bottleneck of real-time sensing, reconfigurable scattering, comprehensive optimization, intelligent chip design and so on, and aims to establish the design methodology of self-adaptive electromagnetic cloaking system. The system can achieve low RCS, broadband cloaking effect, millisecond response and the similarity with the background environment, which will improve the real-time self-adaptive cloaking ability under radar detection and promote the application of cloaking technology in areas such as security and protection, electromagnetic infrastructure and intelligent military.



10 基于物联网和AI的挂车电控智能化管理系统

信电学院史治国教授负责的该项目获批2022年重点研发计划资助。项目聚焦于商用挂车高效智能的控制与管理，利用新一代云边协同的物联网架构，通过多层次的人工智能技术等关键技术，形成高度自主化的挂车电控智能化管理设备及系统。将有效突破国外厂商对商用挂车电控系统的高度垄断，推动国产商用车电控系统的技术积累与长足进步。

Intelligent Management System of Trailer Electric Control Based on IoT and AI



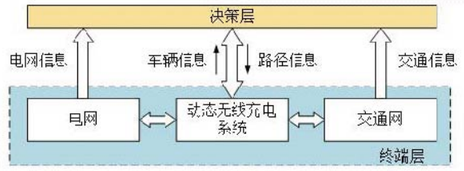
The project led by Prof. Shi Zhiguo from ISEE, was supported by the key R&D Program of Zhejiang Province in 2022. It focuses on the efficient and intelligent control and management of commercial trailers. The project uses the new generation of IoT and multi-level AI technology to form a highly autonomous trailer electronic control intelligent management device and system with independent intellectual property rights, promoting the technological accumulation and substantial progress of domestic commercial vehicle electronic control systems.

11 融合动态无线充电的智能微电网与智慧交通运行优化系统研究与应用

控制学院苏宏业教授负责的该项目获批2022年重点研发计划资助。项目针对电动汽车动态无线充电系统与智能微电网、智慧交通融合的问题展开研究，建立电动汽车动态无线系统的自适应控制与优化方法，提出基于预测控制的微电网–动态无线充电系统–交通网的协同优化运行策略，推动电动汽车动态无线充电技术的应用与发展。

Research and Applications of Smart Microgrid and Intelligent Transportation Collaboration Operation with Dynamic Wireless Charging in Electric Vehicles

The project, led by Prof. Su Hongye from CSE, was supported by the Key R&D Program of Zhejiang Province in 2022. The project focuses on the research and applications on the integration of dynamic wireless charging system in electric vehicles with the smart microgrid and intelligent transportation. The project establishes the adaptive control and optimization method of electric vehicle dynamic wireless system, proposes the collaborative optimization operation strategy of micro-grid, dynamic wireless charging system and transportation network based on predictive control, and promotes the application and development of electric vehicle dynamic wireless charging technology.

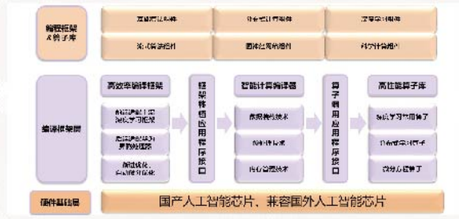


12 智能计算系统软件平台设计

计算机学院吴飞教授负责的该项目获批2022年重点研发计划资助。项目重点研发支持人工智能编程框架训练所得智能模型在国产终端推理芯片上移植、智能计算编译器优化和高性能算子库研发等算法模型和支撑平台，初步形成支持国产终端推理芯片的工具链。

System Software and Platform for AI Computing

This project, led by Prof. Wu Fei from CCST, was supported by the Key R&D program of Zhejiang Province in 2022. In general, this project will deploy the AI model trained by national AI programming framework (such as Paddle Paddle and Mindspore) on national inference chips, propose optimization methods of AI compilers and develop high-performance AI operators.

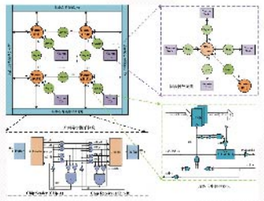


13 基于存算一体器件的众核架构类脑芯片研发及应用

由计算机学院马德副教授负责的该项目获批2022年重点研发计划资助。项目聚焦于基于异步通讯机制的类脑计算芯片架构研究，解决存算一体器件稳定性差、规模化集成困难及芯片级灵活扩展难问题。从存算一体器件、功能部件、系统架构和软件工具四个层面展开研究，对于发展新型的大规模并行信息处理架构、探索类脑计算芯片新型集成方式，研发真正具有存算一体特性的类脑计算芯片具有重要的意义。

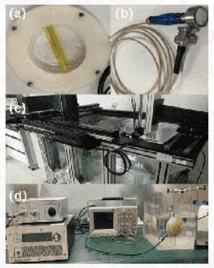
Research on Multi-Core Architecture Neuromorphic Chip Based on CIM Device

The project, led by Associate Prof. Ma De from CCST, was supported by the Key R&D program of Zhejiang Province in 2022. The project focuses on the research of brain-like computing chip architecture based on asynchronous communication mechanism. The research will be carried out from four aspects: compute-in-memory devices, functional components, system architecture and software tools, which is of great significance to the development of a new large-scale parallel information processing architecture and the exploration of new integration methods of neuromorphic chips with the characteristic of compute-in-memory.



14 高强度超声换能器研制及高强度声场检测关键技术研究

生仪学院郑音飞副教授负责的该项目获批2022年重点研发计划资助。项目主要开展超声计量方法研究，完善我国超声计量溯源体系；开发高功率超声测量系统，研制高强度超声设备的计量校准装置、传递标准和现场校准设备；最终利用压电膜片研制出温度分布测量系统，实现对超声设备、特别是高强度超声设备所产生的温度场的精确测量，填补高强度超声测温的国内空白。



Development of High Intensity Ultrasonic Transducer and Research on Key Technology of High Intensity Acoustic Field Detection

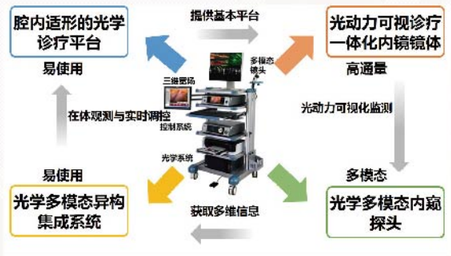
The project, led by associate Prof. Zheng Yinfei from BME, was supported by the Key R&D program of Zhejiang Province in 2022. The project develops the standard hydrophones and high-strength standard hydrophones to improve the traceability system of ultrasonic measurement in China. Simultaneously, the detection of acoustic parameters shock wave sound pressure waveform and sound intensity distribution are promoted under high intensity ultrasonic measurement system. Finally, the temperature distribution measurement system is obtained by using the piezoelectric diaphragm to realize the accurate measurement of the temperature field generated by the ultrasonic equipment.

15 光学多模态跨尺度内窥诊疗实验系统

光电学院杨青教授负责的该项目获批2022年基金重大项目资助。项目拟研制出具有自主知识产权的腔内环境下光学多模态跨尺度内窥诊疗实验系统：包括独有的腔内适形光学平台、大钳道三维宽场光谱变焦镜体、多模态内窥探头、混合增强现实显示功能等等，为肿瘤边界感知和光动力效应实时检测提供硬件基础，为光动力疗−测−控一体化提供新技术与新设备。

Cross-Scale Optical Multimodal Endoscopic Diagnosis and Treatment Experimental System

The project directed by Prof. Yang Qing from COSE, was supported by NSFC Major Program in 2022. The project will develop an optical multi-modal cross-scale endoscopic diagnosis and therapy experimental system with proprietary intellectual property rights, including the unique intraluminal conformal optical platform, a three-dimensional multispectral wide-field endoscope with a large clamp channel and optical zoom function, multimodal endoscopic probes, mixed augmented reality real-time display and so on. The system will provide hardware basis for real-time detection of tumor boundary and photodynamic effects, as well as new technologies and devices for the integration of photodynamic treatment-monitoring-regulation, promoting applications in several important fundamental fields.

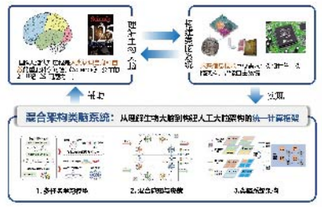


16 模拟生物智能的混合架构类脑系统及应用验证

计算机学院唐华锦教授负责的该项目获批2022年基金重点项目资助。项目聚焦基于生物脑的混合架构计算系统，探索通用类脑计算理论和方法。重点研究脉冲信息表达、多模态感知、多脑区协同、多任务学习等关键理论和方法，实现感知、决策、行为神经活动与环境的闭环交互，有望在类脑计算理论和架构方向上取得突破性和引领性进展。

Brain-Inspired System with Hybrid Architecture Emulating Biological Intelligence and Its Application Verification

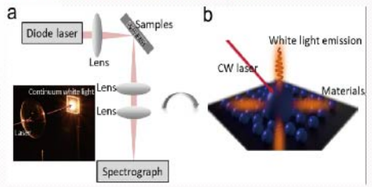
The project, led by Prof. Tang Huajin from CCST, was supported by Key Projects of NSFC International Cooperation Program in 2022. This project dedicates to investigating generic structures and calculation mechanisms of different biological brains and then puts forward a minimized, flexible, universal abstract multi-brain regions structure. This project will establish the mapping methods between neuronal activities, neural circuits and perception, decision, behaviors, focusing on the key theories and methods of information representation using spikes, hybrid computing with digital-analog signals, and multi-task learning. The project is expected to achieve a breakthrough and inspiring results in establishing unified theories and architectures of neuromorphic computing.



17 连续激光激发的波长可调控光源：现象、机制、调控与应用

光电学院邱建荣教授负责的该项目获批2022年基金委国际(地区)合作与交流项目资助。项目将通过气相及液相手段制备氮化物薄膜以及纳米陶瓷，实现对红外激光激发白光发射（LIWE）发射光子在频域以及空间分布的调控，提出LIWE的普适性的唯像模型。另外，将借助LIWE过程将红外光上转换为可见光，实现红外光间接驱动太阳能电池实现光−电转换。本项目研究成果将推动高效LIWE材料的开发和应用。

Tunable Wavelength Emission Source Excited by CW Laser Diode: Phenomenon, Mechanism, Control and Applications



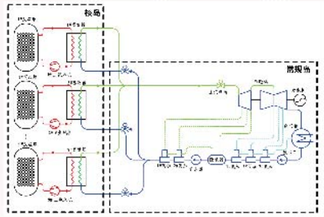
The project, led by Prof. Qiu Jianrong from COSE, was supported by the NSFC International Cooperation and Exchange Program in 2022. This project will investigate laser induced white light emission (LIWE) of metal nitride materials. Furthermore, it will employ different in-situ and ex-situ techniques and theoretical models to examine the progress of LIWE. Finally, by leveraging the ability of conversion infrared radiation (IR) to visible emission, it will demonstrate indirect photon-to-electricity conversion under IR irradiation by using solar cells. The results of this project are expected to advance the development and application of highly efficient LIWE materials.

18 多模块高温气冷堆核电站高效运行的实时优化理论与方法

控制学院邵之江教授负责的该项目获批2022年基金委国际(地区)合作与交流项目资助。项目将重点围绕多模块操作运行的复杂耦合和非线性、负荷不平衡/参数不匹配，以及操作对象时变特性引起的模块间差异及性能退化等因素，研究全联立机理模型的分析与再造、模型校正与运行优化一体化、机组负荷优化分配与工况切换动态优化、人机融合的运行优化决策等基础理论和方法，为多模块高温气冷堆核电站安全、高效运行和性能持续优化提升提供理论和技术支撑。

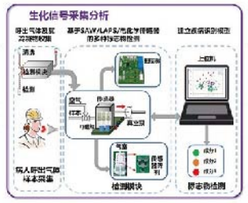
Theory and Methods for Effective Operation of the Modular High Temperature Gas-Cooled Reactor Nuclear Power Plant

The project, led by Prof. Shao Zhijiang from CSE, was supported by the NSFC International Cooperation and Exchange Program in 2022. The research topics include simultaneous mechanism model analysis and reengineering, integrated model correction and real-time optimization, load assignment optimization and dynamic optimization for load changes, and human-machine coordinated decision making. Novel and practical results can be expected to provide theoretical and technical support for safe and efficient operation and continuous performance improvement of the modular high temperature gas-cooled reactor nuclear power plant.



19 用于疾病早期无创筛查的人体呼出气体与唾液检测微纳传感器与仪器

生仪学院王平教授负责的该项目获批2022年国家自然科学基金国际合作项目资助。项目聚焦于研制新型微纳传感器与仪器，通过检测人体呼出气体及其冷凝物以及唾液中的疾病标志物，实现肺部疾病的早期、无创和快速筛查。采用临床样品检测和病理分析相结合的方法，确认和优化人体呼出气体及唾液中与肺部疾病相关的标志物，研制多种标志物联合检测的新型微纳生物传感器等仪器。

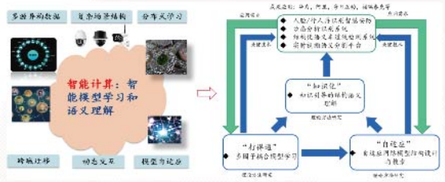


Micro-Nano Sensors and Instruments for Detection of Exhaled Breath and Saliva in Early Noninvasive Screening of Diseases

The project, led by Prof. Wang Ping from BME, was supported by NSFC International Cooperation Program in 2022. This project focuses on the development of instruments integrated with novel micro-nano sensors to detect disease biomarkers both in exhaled air and saliva for precise early screening and diagnosis of lung diseases. The project aims to identify and optimize biomarkers associated with lung diseases in human exhaled breath and saliva by conducting clinical and pathological studies. Further, novel micro-nano sensors and instruments for joint detection of these biomarkers will be developed, and thus the lung diseases can be diagnosed rapidly and non-invasively in the early stages.

20 智能学习理论、方法与应用

计算机学院李玺教授负责的该项目获批2022年国家杰出青年科学基金资助。项目以“智能计算”中语义关联建模和结构知识表达等关键科学问题为切入点，从学习机理和学习方式两方面进行重点突破。创新性科学发现包含三方面：1）多因子耦合模型学习－“打得通”。2）知识引导的模型结构设计与搜索－“自适应”。3）数据与模型驱动的结构语义理解－“知识化”。

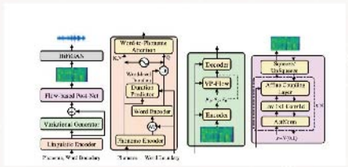


Intelligent Learning Theory, Methodology and Application

The project, led by Prof. Li Xi from CCST, was supported by NSFC for Distinguished Young Scholars in 2022. Prof. Li took key scientific issues such as semantic association modeling and structural knowledge expression in "intelligent computing" as the starting point, and made key breakthroughs in two aspects: learning mechanism and learning method. Specific innovative scientific discoveries would be researched in the following three aspects: multi-factor coupling model learning, knowledge-guided model structure design and search, data and model-driven structural semantic understanding.

21 多模态理解与生成

计算机学院赵洲教授负责的该项目获批2022年优秀青年科学基金资助，长期从事多模态理解与生成研究。本项目拟重点研究针对多模态人机交互场景的多样性，探索不同场景多模态数据差异化分布的建模，研究跨领域多模态语义理解。

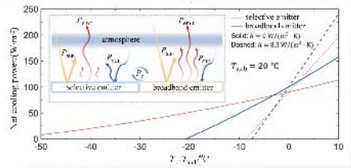


Multimodal Understanding and Generation

The project, directed by Prof. Zhao Zhou from CCST, was supported by NSFC for Excellent Young Scholars in 2022. Zhao has been engaged in research on multimodal understanding and generation. This project aims to focus on the diversity of multimodal human-computer interaction, explore differentiated distribution modeling of multimodal data in various contexts, and study cross-domain multimodal semantic understanding.

22 自适应动态可调辐射制冷超表面研究

光电学院马耀光研究员负责的该项目获批2022年优秀青年科学基金资助，团队长期致力于研究介观尺度上光与物质相互作用的机理与相关效应及其应用。本项目涉及多学科交叉，重点研究光学超表面结构的动态调控机理与柔性协同封装技术，致力于构建面向全天候、多模态的零能耗辐射制冷技术的科学原理探索与工程应用实践。

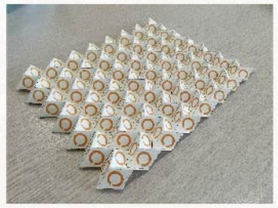


Self-Adaptive Metasurface for Dynamic Radiative Cooling Applications

The project, directed by Researcher Ma Yaoguang from COSE, was supported by NSFC for Excellent Young Scholars in 2022. Ma's group focuses on the study of light-matter interactions at mesoscopic-scale, and micro/nano-techs stem from these interactions for advanced applications in photonic, electronic, and energy systems. This project would focus on the dynamic control of optical metasurfaces for all-weather condition, multi-modal radiative cooling technology.

23 新型折纸电磁表面

信电学院王作佳研究员负责的该项目获批2022年优秀青年科学基金资助，长期从事人工电磁结构理论与应用研究。本项目拟重点研究曲变折纸电磁表面的电磁调控机理与技术，开发新型轻薄、易延展、节能的电磁调控材料，开拓折纸电磁表面在智能通信和电磁频谱感知等领域中的新应用。

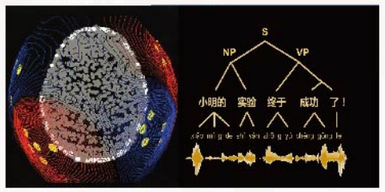


Novel Origami Electromagnetic Surfaces

The project, directed by Researcher Wang Zuojia from ISEE, was supported by NSFC for Excellent Young Scholars in 2022. The project will focus on the mechanisms and techniques in curved origami electromagnetic surfaces, and devote to developing novel materials with lightweight, deployable and low energy-consuming performance. It aims to promote new applications of origami electromagnetic surfaces in intelligent communications and electromagnetic spectrum perception.

24 语音理解的认知神经机制

生仪学院丁鼐研究员负责的该项目获批2022年优秀青年科学基金资助。本项目拟研究大脑皮层多时间尺度的神经振荡是否表征自然语言中动态变化的复杂短语结构，探究语音韵律线索影响短语结构的神经表征，最终形成关于自然语音理解过程中层级语音结构神经编码的新理论。

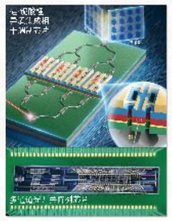


Cognitive Neural Mechanism of Speech Comprehension

The project, directed by Researcher Ding Nai from BME, was supported by NSFC for Excellent Young Scholars in 2022. This project aims to dissociate the cognitive neural representations of speech envelope as a basic auditory feature, and of the abstract speech units related to the perception of syllables. The project will study whether the multi-time scale neural oscillations of the cerebral cortex can represent the dynamically changing complex phrasal structures in natural speech. It is expected to establish a new theory on the neural encoding of hierarchical speech structures in the process of natural speech understanding.

25 硅基异质集成光电芯片创新团队

光电学院刘柳百人计划研究员领衔的团队获批2022年浙江省领军型创新创业团队。团队面向数据中心高速信息互连和处理中的高速光收发和低功耗光开关两类关键光电芯片以及混合集成关键技术开展研究。在功能、带宽、能耗方面提升光电收发芯片参数，进一步从光开关单元器件新原理、新结构及新工艺等源头上创新，实现多端口光开关阵列，构建从单元器件到大规模集成的全链条创新研究体系，为实现新一代智能化低能耗数据中心提供核心技术支撑。



Innovation Group of Heterogeneous Silicon Photonic Integrated Circuits

The group, led by Researcher Liu Liu from COSE, was approved by the Leading Innovative Team of Zhejiang Province in 2022. They focus on the high-speed optical transceiver and low-power-consumption optical switch chips in data-center interconnect and information processing, as well as the related heterogeneous integration technologies. They will be pursuing improved designs to improve the functionality, bandwidth, and power consumption of a transceiver chip and a multi-port optical switch fabric, which then helps break the bottle neck of the current technology. They will also build an innovative system from single elements to large-scale integrated chips, and provide support for next-generation intelligent and energy-efficient data centers.

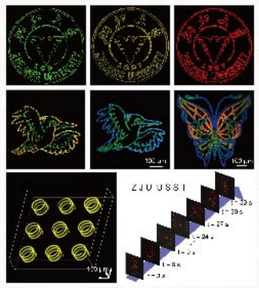
5.年度代表性论文 | Recommended Paper

1 Three-Dimensional Direct lithography of Stable Perovskite Nanocrystals in Glass

作者: Ke Sun, Dezhi Tan, Jianrong Qiu; 等

来源: SCIENCE 卷: 375 期: 6578 页: 307-310 出版年: Jan 2022

We report three-dimensional (3D) direct lithography of PNCs with tunable composition and bandgap in glass. The halide ion distribution was controlled at the nanoscale with ultrafast laser–induced liquid nanophase separation. The PNCs exhibit notable stability against ultraviolet irradiation, organic solution, and high temperatures (up to 250°C). Printed 3D structures in glass were used for optical storage, micro–light emitting diodes, and holographic displays. The proposed mechanisms of both PNC formation and composition tunability were verified.



2 Topological Chern Vectors in Three-Dimensional Photonic Crystals

作者: Guigeng Liu, Zhen Gao, Yihao Yang; 等

来源: NATURE 卷: 609 期: 7929 页: 925-930 出版年: SEP 2022

We use magnetically tunable 3D photonic crystals to achieve the experimental demonstration of Chern vectors and their topological surface states. We demonstrate Chern vector magnitudes of up to six, higher than all scalar Chern numbers previously realized in topological materials. The isofrequency contours formed by the topological surface states in the surface Brillouin zone form torus knots or links, whose characteristic integers are determined by the Chern vectors. These results establish the Chern vector as an intrinsic bulk topological invariant in 3D topological materials.

3 Swarm of Micro Flying Robots in the Wild

作者: Xin Zhou, Xiangyong Wen, Fei Gao; 等

来源: SCIENCE ROBOTICS 卷: 7 期: 66 文献号: 5954 出版年: MAY 2022

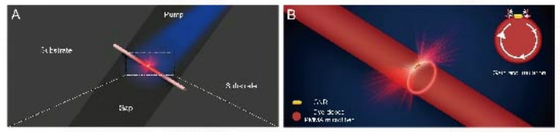
To enable aerial swarm navigation in the wild, we develop miniature but fully autonomous drones with a trajectory planner that can function in a timely and accurate manner based on limited information from onboard sensors. The developed palm-sized platform is equipped with onboard perception, localization, and control. Real-world field experiments validate the performance of our system. The work evolves aerial robotics in cluttered environment navigation, task extensibility, and swarm coordination.

4 Strong Mode Coupling-Enabled Hybrid Photon-Plasmon Laser with a Microfiber-Coupled Nanorod

作者: Zhou Ning, Pan Wang, Limin Tong; 等

来源: SCIENCE ADVANCES 卷: 8 期: 27 文献号: eabn2026 出版年: JUL 2022

We report direct observation of lasing in microfiber-coupled single plasmonic nanoparticles. By strongly coupling a gold nanorod (GNR) with the whispering gallery cavity of a dye-doped polymer microfiber, the significantly enhanced optical coherence of the hybrid photon-plasmon mode and effective gain accumulated from the active microfiber cavity enable single-mode laser emission from the GNR at room temperature. The results may open new opportunities in areas such as ultraconfined field manipulation, ultrasensitive sensing and on-chip optical interconnects.

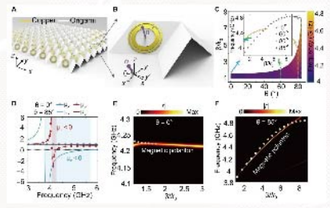


5 Topologically Reconfigurable Magnetic Polaritons

作者: Min Li, Hongsheng Chen, Zuojia Wang; 等

来源: SCIENCE ADVANCES 卷: 8 期: 50 文献号: eadd6660 出版年: DEC 2022

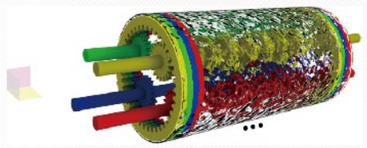
We demonstrate how origami fused with artificial magnetism unveils a versatile pathway to topologically reconfigure magnetic polaritons. The three-dimensional origami deformation allows to reconfigure hyperbolic or elliptic topology of polariton dispersion and modulate group velocity. With group velocity transitioning from positive to negative directions, we further report reconfigurable origami polariton circuitry in which the polariton propagation and phase distribution can be tailored. Our findings provide alternative perspectives on on-chip polaritonics, with potential applications in energy transfer, sensing, and information transport.



6 Diffusive Topological Transport in Spatiotemporal Thermal Lattice

作者: Guoqiang Xu, Yihao Yang, Hongsheng Chen; 等

来源: NATURE PHYSICS 卷: 18 期: 4 页: 450-456 出版年: APR 2022



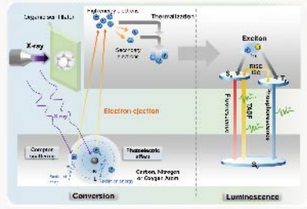
We report the discovery of diffusion-based topological states supported by spatiotemporally modulated advections stacked over a fluidic surface. This arrangement imitates a periodic propagating potential in an effective thermal lattice. We observe edge states in topologically non-trivial and bulk states in topologically trivial lattices. Our findings establish a framework for topological diffusion and thermal edge or bulk states.

7 Thermally Activated Delayed Fluorescence (TADF) Organic Molecules for Efficient X-ray Scintillation and Imaging

作者: Wenbo Ma, Yirong Su, Yang (Michael) Yang; 等

来源: NATURE MATERIALS 卷: 21 期: 7 页: 836-836 出版年: JUL 2022

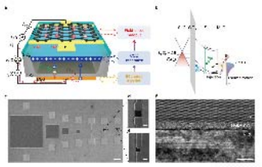
We report on scintillators based on thermally activated delayed fluorescence (TADF) molecules that can harvest triplet excitons under X-ray excitation and increase the efficiency and imaging quality of X-ray detectors. We demonstrate that TADF scintillators have higher light yield, faster decay time, lower afterglow and better spatial resolution than conventional anthracene-based scintillators. These findings suggest that TADF scintillators are promising candidates in a variety of applications.



8 Graphene Charge-injection Photodetectors

作者: Yang Xu, Chao Gao, Bin Yu; 等

来源: NATURE ELECTRONICS 卷: 5 期: 5 页: 281-288 出版年: MAY 2022



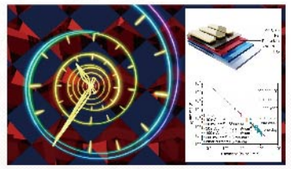
We report graphene charge-injection photodetectors. The devices have a deep-depletion silicon well for charge integration, single-layer graphene for non-destructive direct readout and multilayer graphene for infrared photo charge injection. The photodetectors offer broadband imaging from ultraviolet (around 375 nm) to mid-infrared (around 3.8 μm), a conversion gain of 700 pA per electron, a responsivity above 0.1 A W−1 in the infrared region and a fast response time under 1 μs.

9 Ultrastable Near-Infrared Perovskite Light-Emitting Diodes

作者: Bingbing Guo, Baodan Zhao, Dawei Di; 等

来源: NATURE PHOTONICS 卷: 16 期: 9 页: 637-643 出版年: SEP 2022

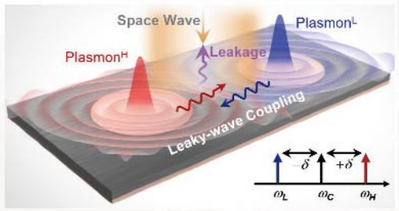
We demonstrate ultra stable and efficient perovskite LEDs with record-long operational lifetimes. Key to this stability is the introduction of a dipolar molecular stabilizer, which interacts with the cations and anions at the perovskite grain boundaries. These results remove the critical concern that halide perovskite devices may be intrinsically unstable, paving the path towards industrial applications.



10 Radiative Anti-Parity-Time Plasmonics

作者: Yumeng Yang, Hongsheng Chen, Fei Gao; 等

来源: NATURE COMMUNICATIONS 卷: 13 期: 1 页: 7678 出版年: DEC 2022



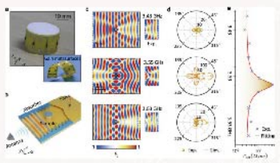
We propose a radiative plasmonic APT design to harness space waves. We observe two exotic phenomena unrealized previously. Rotating polarizations of incident space waves, we realize polarization-controlled APT phase transition. Tuning incidence angles, we observe multi-stage APT phase transition in higher-order APT systems, constructed by using the scalability of leaky-wave couplings. Our scheme shows promise in demonstrating novel APT physics, and constructing APT-symmetry-empowered radiative devices.

11 Breaking the Fundamental Scattering Limit with Gain Metasurfaces

作者: Chao Qian, Xiao Lin, Hongsheng Chen; 等

来源: NATURE COMMUNICATIONS 卷: 13 期: 1 页: 4383 出版年: JUL 2022

We proposed in theory a mechanism to overcome the single-channel scattering limit by exploiting gain media. In experiments, we observed that the scattering cross section of a two-dimensional resonator encircled by a gain metasurface - which could be implemented based on negative-resistance components - exceeds the single-channel limit by more than 40-fold. Our finding indicates a gain route to greatly enhance the scattering and light-matter interactions.

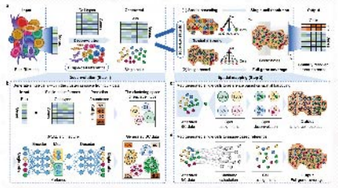


12 De Novo Analysis of Bulk RNA-Seq Data at Spatially Resolved Single-Cell Resolution

作者: Jie Liao, Yin Fang, Huajun Chen; 等

来源: NATURE COMMUNICATIONS 卷: 13 期: 1 页: 1-19 出版年: OCT 2022

We introduce Bulk2Space, a deep learning framework-based spatial deconvolution algorithm that can simultaneously disclose the spatial and cellular heterogeneity of bulk RNA-seq data using existing single-cell and spatial transcriptomics references. The use of bulk transcriptomics to validate Bulk2Space unveils, in particular, the spatial variance of immune cells in different tumor regions, the molecular and spatial heterogeneity of tissues during inflammation-induced tumorigenesis, and spatial patterns of novel genes in different cell types.



13 Dual-Field-of-View High-Spectral-Resolution Lidar: Simultaneous Profiling of Aerosol and Water Cloud to Study Aerosol-Cloud Interaction

作者: Nanchao Wang, Da Xiao, Xue Shen; 等

来源: PNAS 卷: 119 期: 10 文献号: e2110756119 出版年: MAR 2022

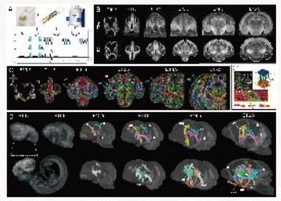
Aerosol-cloud interaction (ACI) plays a vital role in the cooling of Earth's climate. Hitherto, current understanding of ACI processes is hampered by inadequate observational capability. To overcome this conundrum, we present a lidar-based technique as a unique remote-sensing tool without thermodynamic assumptions for simultaneously profiling diurnal aerosol and water cloud properties with high resolution. This technique is expected to represent a significant step forward in characterizing ACI.

14 A Diffusion MRI-Based Spatiotemporal Continuum of the Embryonic Mouse Brain for Probing Gene-Neuroanatomy Connections

作者: Dan Wu, Linda J. Richardsd, Zhiyong Zhao; 等

来源: PNAS 卷: 119 期: 7 文献号: e2111869119 出版年: Feb 2022

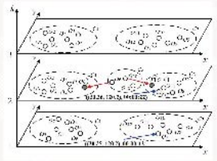
We developed a novel MRI sequence to achieve 30-micron isotropic ultra-high-resolution diffusion MRI of mouse embryos with 3D-DW-GRASE imaging sequence, and established spatial and temporal mapping of brain development. Moreover, this study integrated genetic data to reveal the temporal and spatial changes in the early development of embryonic brain and illustrated the interaction between genes and brain structural development.



15 Evolutionary Clustering of Moving Objects

作者: Tianyi Li, Lu Chen, Yunjun Gao; 等

来源: ICDE (The Best Paper Award) 会议时间: May 9-12, 2022 地点: ELECTR NETWORK

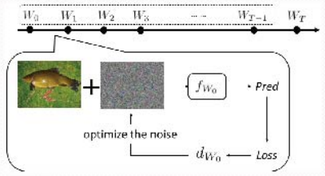


We proposed in theory a mechanism to overcome the single-channel scattering limit by exploiting gain media. In experiments, we observed that the scattering cross section of a two-dimensional resonator encircled by a gain metasurface - which could be implemented based on negative-resistance components - exceeds the single-channel limit by more than 40-fold. Our finding indicates a gain route to greatly enhance the scattering and light-matter interactions.

16 Adversarial Examples for Proof-of-Learning

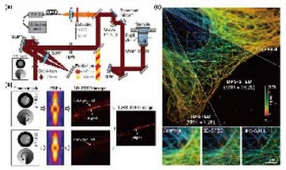
作者: Rui Zhang, Jian Liu, Kui Ren; 等
来源: IEEE SYMPOSIUM ON SECURITY AND PRIVACY (SP)
会议时间: MAY 23-26, 2022 地点: San Francisco, CA 出版年: JUL 2022

A PoL proof includes a set of intermediate models recorded during training, together with the corresponding data points used to obtain each recorded model. This research shows that PoL is vulnerable to "adversarial examples"! Specifically, in a similar way as optimizing an adversarial example, an arbitrarily-chosen data point could "generate" a given model. This research demonstrates, both theoretically and empirically, that any PoL proof can be forked.



17 Accurate Background Reduction in Adaptive Optical Three-Dimensional Stimulated Emission Depletion Nanoscopy by Dynamic Phase Switching

作者: Shijie Tu, Xin Liu, Difu Yuan; 等
来源: ACS PHOTONICS (Cover Paper) 卷: 9 期: 12 页: 3863–3868 出版年: NOV 2022



Stimulated emission depletion (STED) fluorescence nanoscopy allows three-dimensional (3D) visualization of nanoscale subcellular structures. However, 3D-STED imaging and quantification of dense features are obstructed by severe background noise. Here, we can accurately measure and remove the background by combining adaptive optical elements and dynamic phase modulation. This technique promises to be an important step toward high-quality 3D-STED imaging.

18 Shipborne Oceanic High-Spectral-Resolution Lidar for Accurate Estimation of Seawater Depth-Resolved Optical Properties

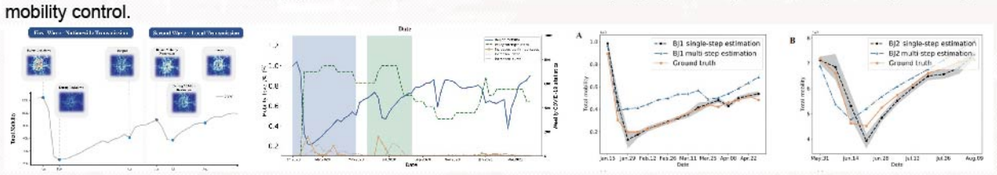
作者: Yudi Zhou, Yang Chen, Hongkai Zhao; 等 来源: LIGHT-SCIENCE & APPLICATIONS
卷: 11 期: 1 文献号: 261 出版年: SEP 2022

We demonstrate the first shipborne oceanic high-spectral-resolution lidar (HSRL) in accurately estimating seawater depth-resolved optical properties. The HSRL improves the accuracy by at least 2 times with respect to elastic lidar. The high accuracy allows it to finely characterize vertical distributions from open ocean waters to moderate turbid waters and diel thin layers dynamics. The technique describes a great potential in fields of marine sciences and multi-layered couplings of earth.

19 Policy and Newly Confirmed Cases Universally Shape the Human Mobility During COVID-19

作者: Kehan Li, Chao Li, Jiming Chen; 等
来源: NATIONAL SCIENCE OPEN 卷: 1 期: 1 编号: 20220003 出版年: MAY 2022

This study provides a system for forecasting COVID-19 urban human mobility using a generalized conditional generation adversarial network. The relationship between human mobility, policies, statistics, and their evolution patterns is explored based on human movement data collected during numerous pandemic waves. Proper modeling of the effect of these elements on urban human mobility provides a solid foundation for developing epidemic prevention policies pertaining to mobility control.



人才培养
Education

学部共有11个一级学科博士学位授予点，22个二级学科博士学位授予点，13个本科专业。光电信息科学与工程、电子科学与技术、自动化、计算机科学与技术、软件工程、生物医学工程等6个本科专业入选国家级一流本科专业建设点。在校生（包含本科生和研究生）11218人，在国内外各类学科竞赛中成绩优异，本科生深造率接近60%。依托学部建设“信息+X”多学科交叉人才培养中心，推进具有多学科交叉创新研究能力的拔尖人才培养。

There are totally 11 doctorate programs of primary discipline, 22 doctorate programs of secondary discipline, 13 undergraduate programs. 6 undergraduate programs were selected in the country's construction plan list of first-class undergraduate programs. About 11218 full-time undergraduate and graduate students are enrolled in the faculty. They have made outstanding achievements in various international and domestic disciplinary competitions. Nearly 60% undergraduate students continue their studies at home or aboard. The "Information + X" Multidisciplinary Talent Training Center is developed to promote the cross-innovation capability of graduate student.

本科专业 UG Program

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
	机器人工程 Robot Engineering
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
	软件工程 Software Engineering
	信息安全 Information Safety
	工业设计 Industrial Design
	产品设计 △ Product Design △
	人工智能 ★ Artificial Intelligence ★
生物医学工程与仪器科学学院 Biomedical Engineering and Instrument Science	生物医学工程 Biomedical Engineering

★ 仅在竺可桢学院招生 Enrolling in Chu Kochen Honors College
△ 2021年取消招生 Cancelled in 2021

学科 Discipline

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

人工智能 Artificial Intelligence

集成电路科学与工程 Integrated Circuit Science and Engineering

设计学 Design
设计艺术学 Art of Design

学生（人） Student

学生 Students	学院 College	光电学院 COSE	信电学院 ISEE	控制学院 CSE	计算机学院 CCST	软件学院 CST	生仪学院 BME	微纳电子学院 MNE	合计 Total
在校生 Enrollments	博士生 Doctor	365	464	395	916	32	252	102	2526
	硕士生 Master	389	592	430	1036	1183	255	222	4107
	本科生 Undergraduate	392	1193	644	2004	/	352	/	4585
招生数 Freshmen	博士生 Doctor	96	110	92	237	14	54	39	642
	硕士生 Master	120	202	140	349	389	84	87	1371
	本科生 Sophomore	84	243	150	504	/	97	/	1078
毕业生 Graduates	博士生 Doctor	57	67	53	82	/	50	/	309
	硕士生 Master	135	202	114	276	95	91	/	913
	本科生 Undergraduate	126	304	165	490	/	122	/	1207
本科生深造与对外交流 Further Study and International Exchange of Undergraduate	毕业生* Graduate*	120	302	145	401	/	122	/	1090
	出国（境）深造率 Ratio of Further Studies Aboard	10%	7.6%	11.03%	17.71%	/	6.56%	/	11.93%
	国内读研率 Ratio of Further Studies at Home	56.7%	56%	56.55%	37.16%	/	43.44%	/	47.8%
	对外交流人次 International Exchange	133	456	202	525	/	201	/	1517

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

浙江省优秀博士学位论文 Zhejiang Provincial Excellent Doctoral Dissertation

作者姓名 Author	指导教师 Supervisor	一级学科 Discipline	论文题目 Title
许弘楠 Xu Hongnan	时尧成 Shi Yaocheng	光学工程 Optical Engineering	面向多维复用的硅基亚波长结构集成光子器件研究 Silicon Integrated Photonic Devices with Subwavelength Structures for Multi-Dimensional Multiplexing
卢锦盛 Lu Jinsheng	李　强　仇　旻 Li Qiang Qiu Min	光学工程 Optical Engineering	微纳尺度几种光致力驱动及其机理研究 Light-Actuated Micro/Nanoscale Mechanical Motions and Their Physical Mechanisms
钱　超 Qian Chao	陈红胜 Chen Hongsheng	电子科学与技术 Electronics Science and Technology	智能电磁隐身和超散射的实验研究 Experimental Study of Intelligent Electromagnetic Invisibility Cloak and Superscattering
张　震 Zhang Zhen	卜佳俊 Bu Jiajun	计算机科学与技术 Computer Science and Technology	基于神经网络的多粒度图表征学习方法研究★ Multi-granularity Graph Representation Learning with Neural Networks★
魏鑫伟 Wei Xinwei	王平 Wang Ping	生物医学工程 Biomedical Engineering	基于心肌细胞的生物传感器及其在药物评价和味觉检测中的应用研究★ Cardiomyocyte-Based Biosensors and Their Applications in Drug Evaluation and Taste Detection★

★浙江省优秀博士学位论文提名论文　Zhejiang Provincial Excellent Doctoral Dissertation Nomination Dissertation

专项奖 Special Award

奖　项 Award	获奖学生 Winners	学　院 College of
2021-2022学年浙江大学竺可桢奖学金 Chu Kochen Scholarship	高宇斌 Gao Yubin	光电科学与工程学院 Optical Science and Engineering
	孙　珂 Sun Ke	光电科学与工程学院 Optical Science and Engineering
	孙淞昱 Sun Songyu	信息与电子工程学院 Information Science and Electronic Engineering
	周　鑫 Zhou Xin	控制科学与工程学院 Control Science and Engineering

学科竞赛 Disciplinary Competition

竞赛名称 Competition	奖　项 Award	获奖人员、队名/作品 Winners List	指导教师 Advisor
国际大学生机器人设计大赛 IDC Robocon	冠军（国际一等奖） First Place	天梯、唐勾无人机：王天力	王　酉 朱秋国
	亚军（国际二等奖） Second Place	shoveler Sam、clipper Bob：李子豪	
	季军（国际二等奖） Second Place	滚轴运球机器人、半自动PID无人机： 郭泽林	
RoboCup机器人世界杯中国公开赛 RoboCup China Open	仿人组冠军（一等奖） First Place in Humanoid League	ZJUDancer： 章国威　余　味　公冶在田　韩陈睿 郑　撼　黄嘉熙　刘将品　董恩佑 于瑞骐　白　彦　杜浩哲　陈芷轲 黄哲远	熊　蓉
	小型组第三名（二等奖） Second Place in Small Size League	ZJUNlic： 杨嘉磊　沈　凝　朱一明　陈　浩 林　康　王　斯　陈烨柯　于佳正 陆炫存　余鹏飞　王惜昀　赵安可 刘昊明	
2022红点设计概念大奖 Reddot Award 2022	设计概念奖 Design Concept	ThermoWear： 阳　月　郭梦妍　祝贶祺　严子涵 崔　强　周子洪　郦家骥　张　婷	王冠云 陶　冶
2022 Dezeen设计奖 2022 Dezeen Design Award	长名单 Long list	ThermoFit: 阳　月　郭梦妍　祝贶祺	王冠云
2022迪拜设计周全球毕业设计展 Global Grad Show 2022	参展 Exhibition	ThermoWear： 阳　月　郭梦妍　祝贶祺　严子涵 崔　强　姬俊哲　周子洪　任　磊 郦家骥　潘德瀛　樊亦涛　罗丹荔 周凌川　陶　冶	王冠云
2022戴森设计大奖 2022 James Dyson Award	中国赛区季军 Second Runner-up (China)	ThermoWear： 阳　月　郭梦妍　祝贶祺　姬俊哲 崔　强　周子洪　郦家骥　樊亦涛 任　磊　周凌川　潘德瀛　严子涵	王冠云 陶　冶 孙凌云

学科竞赛 Disciplinary Competition

竞赛名称 Competition	奖 项 Award	获奖人员、队名/作品 Winners List	指导教师 Advisor
2022年国际大学生程序设计竞赛亚洲区域赛 International Collegiate Programming Contest Asia Regional Contest（ICPC）	冠军 Champion	Phantom Threshold： 唐嘉辰　黎伟诺　李昌栋（沈阳赛区）	王　灿
	亚军 First Runner-up	Solitary Dream： 彭　博　褚写庭　陈　逸（西安赛区）	
	金牌 Gold Medal	Phantom Threshold： 唐嘉辰　黎伟诺　李昌栋（沈阳赛区）	
		nameless story： 凌子恒　胡家齐　林响烨 （南京赛区，合肥赛区）	
		Untitled1： 严子轩　周轩熠　樊　睿 （南京赛区，合肥赛区）	
		You Got a +33： 叶佳昂　李克成　陈科睿 （南京赛区，济南赛区）	
		Billboard for Rent： 任庭旭　徐琪杰　王楚淏 （济南赛区，合肥赛区）	
		Happy One Lead Two： 孙晨毓　谢　集　陈彦博（沈阳赛区）	
		A yes yes team： 尹松屹　王执阔　田宇灼（沈阳赛区）	
		Marry you next time： 李谘远　王　梓　黄嘉尔（济南赛区）	
	银牌 Silver Medal	Abracadabra： 王培成　王造时　邓铭辉（南京赛区）	
		anti-omega evolution： 倪晗楚　程昕宇　陈　科（沈阳赛区）	
2022中国大学生程序设计竞赛 China Collegiate Programming Contest（CCPC）	亚军 First Runner-up	Solitary Dream： 彭　博　褚写庭　陈 逸 （绵阳赛区，威海赛区）	王　灿
		nameless story： 凌子恒　胡家齐　林响烨 （广州赛区，桂林赛区）	
		Duckforces： 张志心　楼沁霈　郭一锴（女生赛）	
	金奖 Gold Medal	Phantom Threshold： 唐嘉辰　黎伟诺　李昌栋（桂林赛区）	
		Qertyuiop： 王　熠　陈思睿　龙香遇（女生赛）	
		Untitled1： 严子轩　周轩熠　樊　睿（桂林赛区）	
		Three AFOers： 孙晨毓　谢　集　赵天健（广州赛区）	

学科竞赛 Disciplinary Competition

竞赛名称 Competition	奖 项 Award	获奖人员、队名/作品 Winners List	指导教师 Advisor
2022中国大学生程序设计竞赛 China Collegiate Programming Contest（CCPC）	银奖 Silver Medal	You Got a +33： 叶佳昂　李克成　陈科睿（绵阳赛区）	王　灿
		Abracadabra： 王培成　王造时　邓铭辉（绵阳赛区）	
		Billboard for Rent： 任庭旭　徐琪杰　王楚淏（威海赛区）	
		Marry you next time： 李谘远　王　梓　黄嘉尔（威海赛区）	
2022中国高校计算机大赛—移动应用创新赛 2022 China Collegiate Computing Contest(C4) -Mobile Application Innovation Competition	一等奖 First Place	AirMemo：张天晓　柏　然　张杨康	张克俊
	二等奖 Second Place	AR Message：林敏慎　黄巧巧　王　鹤	钟文兴 张克俊
		Rephoto重现经典照片：叶景晨	章国锋
		Sweet bomb——预防幼童性侵害游戏设计： 王　序　马玉骏　颜佩琳	张克俊 章国锋
全国大学生电子设计竞赛 2022年TI杯模拟电子系统设计专题邀请赛 2022 National Undergraduate Electronic Design Contest - Analog System Design Invitational Contest (TI Cup)	一等奖 First Place	李萨如（Lissajous）图形演示装置： 刘星宇　任俊宇　郑景泽	李惠忠 张　昱
		李萨如（Lissajous）图形演示装置： 董佳奇　王英杰　应旷野	张　昱 李惠忠
全国大学生电子设计竞赛 2022年英特尔杯嵌入式系统专题邀请赛 Undergraduate Electronic Design Contest - 2022 Embedded System Design Invitational Contest (Intel Cup)	二等奖 Second Place	Make Live Great Again—基于GNS-V40的直播风格实时渲染系统： 陈　鼎　蒋雨峰　陈梓杨	王曰海
2022年第十届全国大学生光电设计竞赛 The 10th National University Students' Opt-Sci-Tech Competition	一等奖 First Place	酮康科技—你的专属运动陪伴： 彭　朕　王振阳　马雨沁　阮余潇 陈乐凯　徐嘉维　张　铁	何赛灵
		“追乐”翻谱器——智能乐谱翻页助手： 鲁文凯　何家建　高　尧　王子超 周杜雯	汪凯巍 林远芳
	二等奖 Second Place	海阳新能源--全被动辐射制冷与水淡化技术先行者： 屠锡涛　王路明　邵贻玥　柯亦婷	汪凯巍 杨　柳
		云兴霞蔚——“自由曲面+体全息”轻薄AR眼镜： 陈泓佐　祝汶江　单得峰　吴玥潼 黄芸璇　舒　天　胡广银	吴仍茂 林远芳
		溯知Search——抗疫流调辅助系统： 涂文靖　宁高宁　邬佳浩　彭可馨　张沈予	汪凯巍

学科竞赛 Disciplinary Competition

竞赛名称 Competition	奖 项 Award	获奖人员、队名/作品 Winners List	指导教师 Advisor
首届中国智能医疗器械创新大赛 The First China Intelligent Medical Device Innovation Competition	一等奖 First Place	Running Patch—新一代智能运动无创监测设备：刘盛晨　郑佳琦	叶学松 梁　波
	二等奖 Second Place	中药智能显微鉴别系统：朱云奇 方秋雨 蒋希程 王思艺飞	许迎科
		基于睡眠状态识别的助眠枕头设计：董长轩　吴佳妮　张雨奇　王泉又　谌亦为	陈　杭 沈义民 郑　婧
第七届全国大学生生物医学工程创新设计竞赛 7th National Biomedical Engineering Innovation Design Competition for College Students	一等奖 First Place	柔性可穿戴智能伤口贴片：熊楚涵　王鸿宇　倪昊祺	刘清君
		基于移动终端的低功耗蓝牙人脸识别测温系统：孙臻烨　林宸屹　沈家乐	刘雪松
	二等奖 Second Place	中文电子病历命名实体识别与关系抽取：赖京竺　李海涛	丁　鼐
		用于口腔慢性疾病风险评估的便携式多参数检测仪：朱建辉　帅奕帆　刘钰沣	梁　波
		中文电子病历命名实体识别和关系抽取：周佳惠 徐心慈 张　颖	黄正行
2022年全国大学生信息安全竞赛（作品赛） 2022 National College Student Information Security Contest (Work Contest)	一等奖 First Place	涅槃：面向构建环境的软件供应链安全性分析系统：郭若容　季高强　陈威锴　潘子曰	申文博
2022年全国大学生信息安全竞赛（创新实践能力赛） 2022 National College Student Information Security Contest (Innovation Practice Ability Contest)	一等奖 First Place	AAA战队：颜尔汛　谢天晰　张智焕　雷　骁	常　瑞

2022要闻

News 2022

3月

3月17日，杭州亚组委郑俊处长一行走进信息学部研讨推进智能亚运合作。

On Mar. 17th, the group led by Zheng Jun, head of information department office, from the Hangzhou Asian Games Organizing Committee, came to FIT to investigate and promote the cooperation between two sides on Intelligent Asian Games.

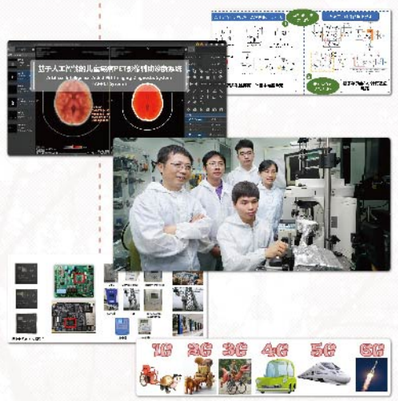
3月20日，软件学院院长尹建伟教授领衔的“跨界服务网络架构及核心设备”项目获第49届日内瓦国际发明展金奖。

On Mar. 20th, the project named “Crossover Service Network Architecture and Core Devices” led by Prof. Yin Jianwei from CST, won the 49th Geneva International Gold Award for Invention.

4月

4月6日，信息学部举办FIT论坛第11期：剑桥大学Tawfique Hasan教授在线分享传感器与光电子器件最新研究进展。

On Apr. 6th, the 11th FIT forum was held successfully and Prof. Tawfique Hasan from Cambridge University shared the latest research progress of sensors and optoelectronic devices online.



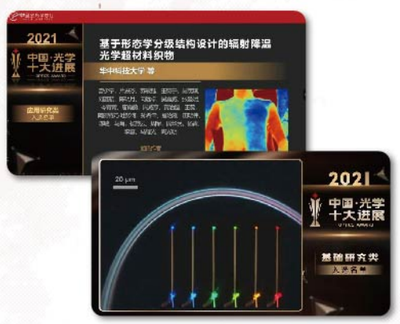
4月19日，信息学部共有5个项目（负责人分别是：童利民、张宏、黄凯、卓成、马建国）入选浙江大学2021年度十大学术进展(三类清单)，其中童利民负责的“冰单晶微纳光纤”项目获突出学术贡献奖。

On Apr. 19th, five projects in FIT were selected as the 2021 top Academic Progress of ZJU(list of three categories)，among which the “Ice Single Crystal Micro-nano Fiber” project led by Prof.Tong Limin from COSE won the Outstanding Academic Contribution Award.

5月

5月5日，控制学院高飞&许超团队成功研制的能“独立思考”的空中机器人，荣登机器人领域权威期刊《科学•机器人》，并被选为期刊5月封面论文。

On May 5th, the research by the team of Gao Fei and Xu Chao from CSE on flying robots with the ability of "independent thinking" was published in Science Robotics as a cover paper.



5月23日，光电学院童利民、郭欣团队研究的“弹性冰单晶微纳光纤”和马耀光团队设计的“无源降温光学超材料织物”科技成果入选2021中国光学十大进展。

On May 23th, two achievements from COSE, "Elastic ice single crystal micro-nano optical fiber" led by Prof. Tong Limin and "passive cooling optical metamaterial fabric" led by researcher Ma Yaoguang, were selected into the Chinese Optics Top Ten Breakthroughs in 2021.

7月

7月14日上午，信息学部青年学者湖州行暨“个推”青年创新奖颁奖活动在湖州研究院举办，同日下午在湖州宾馆组织召开了智慧城市主题研讨会（FIT论坛第12期）。

On Jul. 14th, the FIT Youth Innovation Award ceremony, sponsored by "Getui", was held at the Huzhou Research Institute, ZJU, and the 12th FIT forum with theme of smart city was held at the Huzhou Hotel.

7月20日，网安学院任奎教授入选《麻省理工科技评论》中国2022年隐私计算科技创新人物。

On Jul. 20th, Prof. Ren Kui from CCST was honored as the 2022 Privacy Computing Technology Innovator in China by MIT Technology Review.

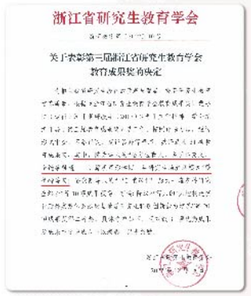
9月

9月2日，控制学院熊蓉教授受邀参加首届大国工匠巾帼论坛。

On Sep. 2nd, Prof. Xiong Rong from CSE was invited to participate in the first Women's Craftsman Forum.

9月28日，计算机学院周昆教授荣获亚洲图形学学会2022年度杰出技术贡献奖。
On Sept. 28th, Prof. Zhou Kun won the 2022 Outstanding Technical Contributions Award by the Asian Graphical Society.

10月


浙江省研究生教育学会

关于表彰第三届浙江省研究生教育学会教育成果奖的决定

10月18日，计算机学院获得第三届浙江省研究生教育学会教育成果奖唯一特等奖。
On Oct. 18th, CCST won the only special prize of the 3rd Zhejiang Provincial Postgraduate Education Society Educational Achievement Award.

10月底，信电学院求是讲席教授、信息学部副主任李尔平教授当选为新加坡工程院院士。
In October, Prof. Li Erping from ISEE, vice-dean of FIT, was elected as Fellow of the Singapore Academy of Engineering.

10月28日，信息学部在华为黄大年茶思屋举办了FIT论坛第13期，学部五位基金委人才项目获得者进行了科研和经验分享，学部主任陈纯出席论坛致辞。
On Oct. 28th, the five winners of the talent project of NSFC shared their scientific research experiences in the 13th FIT forum. Academician Chen Chun, the dean of FIT, attended the forum and delivered a speech.

11月

11月2日，光电学院承办了FIT论坛第14期：2022西湖光电子论坛。
On Nov. 2nd, COSE held the 2022 West Lake Optoelectronics Forum, which was also named the 14th FIT forum supported by FIT.

11月25-27日，信息学部李尔平副主任受邀在中国工程院2022年度国际工程科技战略高端论坛做大会主题报告。
On Nov. 25-27th, Prof. Li Erping, vice-dean of FIT, was invited to give a keynote speech at the 2022 International Engineering Technology Strategy High-End Forum of the Chinese Academy of Engineering.

11月30日，信息学部FIT第15期论坛激光医工信交叉主题研讨在杭州金溪山庄举行，杭州奥创光子技术有限公司参加了交流活动。
On Nov. 30th, FIT held the 15th FIT forum with topics on laser, medical, industrial and information cross-cutting in Jinxi Villa, Hangzhou. Hangzhou Altron Photonics Technology Co., Ltd. participated in the activities.

12月

12月22日，信息学部召开2022年度“个推”青年创新奖评选会，三位优秀青年学者获奖。
On Dec. 22th, FIT held the 2022 Youth Innovation Award Selection Meeting, and three young scholars won the award sponsored by "Getui".

12月24日，浙江大学工业信息物理融合系统（iCPS）省部共建协同创新中心2022年学术年会暨工业互联网学术研讨会在线顺利召开。
On Dec. 24th, the annual academic workshop of ZJU Collaborative Innovation Center for industrial Cyber-Physical System(iCPS) was successfully held.

永平杰出教学贡献奖
Yongping Teaching Contribution Award
计算机学院吴飞教授
Prof. Wu Fei from CCST

宝钢优秀教师奖
Bao Gang Excellent Teacher Award
信电学院史治国教授
Prof. Shi Zhiguo from ISEE

小米青年学者
Xiaomi Young Scholar
控制学院邓瑞龙研究员
Researcher Deng Ruilong from CSE
信电学院詹启伟研究员
Researcher Zhan Qiwei from ISEE

第十七届中国青年科技奖
The 17th Chinese Youth Sci. & Tech Award
控制学院程鹏教授
Prof. Cheng Peng from CSE

首届浙江省青年科技英才奖
The First Zhejiang Provincal Youth Sci. & Tech Excellence Award
控制学院赵春晖教授
Prof. Zhao Chunhui from CSE
信电学院钟财军教授
Prof. Zhong Caijun from ISEE

2022年度弗里德里希·威廉·贝塞尔奖
2022 Friedrich Wilhelm Bessel Research Award
信电学院陈晓明研究员
Researcher Chen Xiaoming from ISEE

第九届陈翰馥奖
The 9th Chen Hanfu Award
控制学院陈积明教授
Prof. Chen Jiming from CSE

吴文俊人工智能最高成就奖
Wu Wenjun AI Highest Achievement Award
计算机学院潘云鹤院士
Academician Pan Yunhe from CCST

吴文俊人工智能科学技术奖
Wu Wenjun AI Sci.& Tech Award
信电学院李荣鹏副教授
Associate Prof. Li Rongpeng from ISEE