浙江大学
信息学部

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

信息学部

浙江大学

Annual Report 2020
FACULTY OF INFORMATION TECHNOLOGY
ZHEJIANG UNIVERSITY

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

Annual 年报
Report **2020**

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15个本科专业，10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3个国家重点实验室，1个国家工程实验室，3个国家工程（技术）研究中心，共有23个研究所，主要开展信息领域科学和工程技术问题的创新研究。

Faculty of Information Technology (FIT) of Zhejiang University (ZJU) comprised of seven 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, including College of Cyber Science and Technology), College of Biomedical Engineering & Instrument Science (BME) ,College of Software Technology (CST) and College of Micro-Nano Electronics (CMNE) . Currently, FIT has 15 undergraduate programs and 10 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 3 State Key Laboratories, 1 National Engineering Laboratory, 3 National Engineering Research Centers, 23 research institutes, to devote to the innovation research on information science and technology.

主任：陈 纯
Dean：Chen Chun

副主任：陈耀武
Vice-Dean：Chen Yaowu

副主任：陈积明
Vice-Dean：Chen Jiming

Annual Report 2020
Faculty of Information Technology
Zhejiang University

浙江大学信息学部

AnnualReport **2020**
Faculty of Information Technology
Zhejiang University

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Academic Exchange and Cooperation Committee

学术咨询评价专门委员会
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- 主 任 陈积明
- 副主任 陈红胜 巫英才 许 超
- 委 员 纪守领 许迎科 孙铭阳 杨 青
  吴仍茂 卓 成 钟财军 徐 杨

Academic Exchange and Cooperation Committee

- **Director** Chen Jiming
- **Vice Director** Chen Hongsheng Wu Yingcai Xu Chao
- **Committee members**

  Ji Shouling Xu Yingke Sun Mingyang Yang Qing
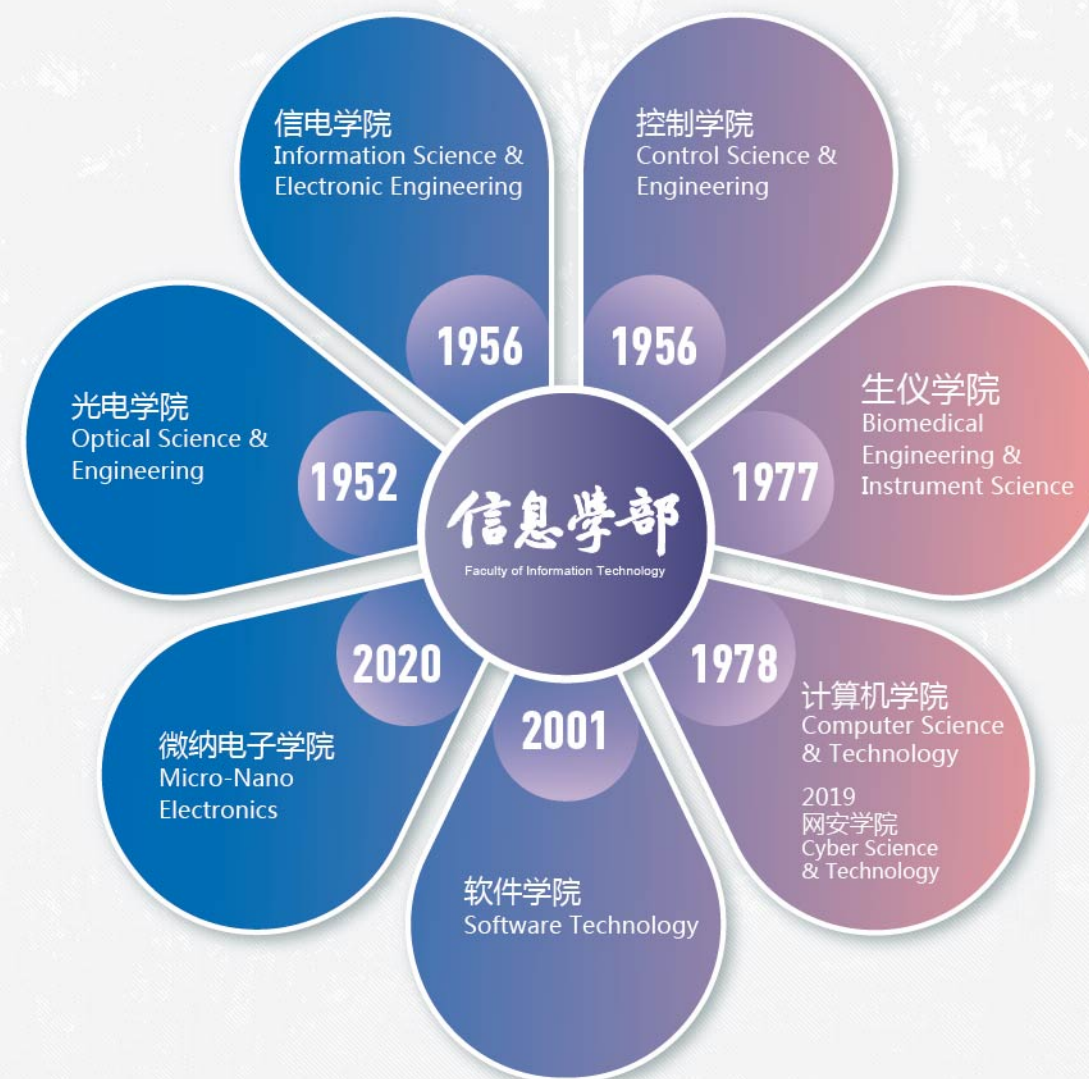 Wu Rengmao Zhuo Cheng Zhong Caijun Xu Yang

学位评定委员会

- 主 任 陈积明
- 副主任 何钦铭
- 委 员 王小松 刘清君 许正平 孙守迁 李春光
  吴 飞 何湘宁 陈红胜 陈祥献 邵之江
  林兰芬 郑臻荣 赵道木 黄志尧 童利民
  虞小鹏

Academic Degrees Committee

- **Director** Chen Jiming **Vice Director** He Qinming
- **Committee members**

  Wang Xiaosong Liu Qingjun Xu Zhengping Sun Shouqian
  Li Chunguang Wu Fei He Xiangning Chen Hongsheng
  Chen Xiangxian Shao Zhijiang Lin Lanfen Zheng Zhenrong
  Zhao Daomu Huang Zhiyao Tong Limin Yu Xiaopeng

学部学院 COLLEGE OF

信电学院
Information Science & Electronic Engineering
1956

控制学院
Control Science & Engineering
1956

光电学院
Optical Science & Engineering
1952

生仪学院
Biomedical Engineering & Instrument Science
1977

信息学部
Faculty of Information Technology

微纳电子学院
Micro-Nano Electronics
2020

软件学院
Software Technology
2001

计算机学院
Computer Science & Technology
1978

2019
网安学院
Cyber Science & Technology

学术委员会

- 主 任 陈 纯
- 副主任 陈耀武 刘 旭
- 委 员 卜佳俊 尹建伟 任 奎 庄越挺 刘向东
  孙优贤 孙凌云 吴汉明 李尔平 杨建义
  时尧成 余 锋 张 宏 张朝阳 陈 刚
  陈积明 邵之江 赵民建 俞 滨 章献民
  程 鹏 鲍虎军 熊 蓉 潘云鹤 戴道锌

Academic Committee

- **Director** Chen Chun **Vice Director** Chen Yaowu Liu Xu
- **Committee members**

  Bu Jiajun Yin Jianwei Ren Kui Zhuang Yueting
  Liu Xiangdong Sun Youxian Sun Lingyun Wu Hanming
  Li Erping Yang Jianyi Shi Yaocheng Yu Feng
  Zhang Hong Zhang Zhaoyang Chen Gang Chen Jiming
  Shao Zhijiang Zhao Minjian Yu Bin Zhang Xianmin
  Cheng Peng Bao Hujun Xiong Rong Pan Yunhe
  Dai Daoxin

学术咨询评价专门委员会

- 主 任 刘 旭
- 副主任 陈积明 李尔平
- 委 员 戴道锌 陈 杭 张朝阳 余 锋 苏宏业
  孙凌云 刘 东 任 奎 尹建伟

Academic Advisory and Evaluation Committee

- **Director** Liu Xu **Vice Director** Chen Jiming Li Erping
- **Committee members**

  Dai Daoxin Chen Hang Zhang Zhaoyang Yu Feng
  Su Hongye Sun Lingyun Liu Dong Ren Kui
 Yin Jianwei

师资队伍
Talent Team

　　学部教职员工783人，其中教学科研岗教师513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入选者9人，教育部高校教学名师1人，国家杰出青年基金获得者20人，国家优秀青年基金获得者16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。

　　2020年新增国务院政府特殊津贴专家2人，国家杰出青年基金获得者1人，国家优秀青年基金获得者2人，浙江省特级专家1人。8位教师晋升教授，8位教师晋升副教授。

FIT has 783 full-time faculty and staff members, including 513 faculty members, There are 5 members of Chinese Academy of Engineering and 1 member of Chinese Academy of Science, 9 professors of National Bai-Qian-Wan Talent Project, 1 Outstanding Teacher in Universities of MOE, 20 National Distinguished Youth Science Foundation Fellows, 16 National Excellent Youth Science Foundation Fellows, 8 Zhejiang Province Outstanding Experts, 2 Innovative Research Groups of NSFC and 2 Innovative Research Teams of MOE.

In 2020, 2 professors won the Government Special Allowance. 1 professor obtained National Science Fund for Distinguished Young Scholar, 2 professors obtained National Science Fund for Excellent Young Scholar, 1 professor was honored with Zhejiang Province Outstanding Expert. 8 teachers were promoted to full professor and 8 teachers were promoted to associate professor.

教学科研队伍职称结构
Professional Structure

- 3%
- 44%
- 32%
- 21%

- 教授 Prof.
- 副教授 Associate Prof.
- 预聘系列 Pre.
- 其他 Others
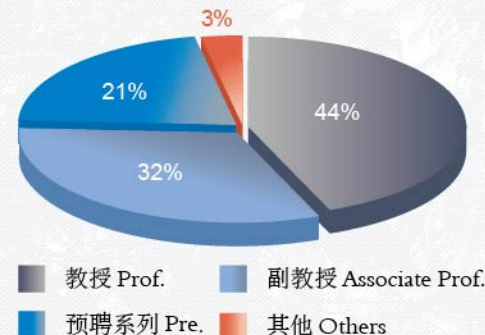
2020年新增 Awarded in 2020

浙江省特级专家
Zhejiang Province Outstanding Expert

陈积明
Chen Jiming

国务院政府特殊津贴专家
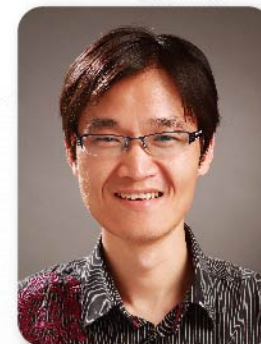**Government Special Allowance Winner**

卜佳俊
Bu Jiajun

杨春节
Yang Chunjie

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

高云君
Gao Yunjun

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

吴仍茂
Wu Rengmao

吴鸿智
Wu Hongzhi

教授
Professors

张 磊
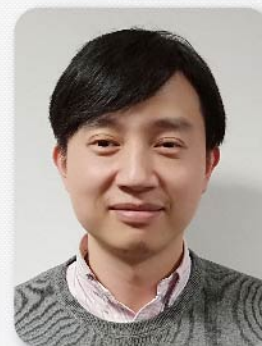Zhang Lei

潘 翔
Pan Xiang

黄 凯
Huang Kai

黄平捷
Huang Pingjie

徐祖华
Xu Zuhua

陈 岭
Chen ling

伍 赛
Wu Sai

张 帆
Zhang Fan

副教授
Associate Professors

谢意维
Xie Yiwei

李荣鹏
Li Rongpeng

张 婷
Zhang Ting

程 然
Cheng Ran

朱晓雷
Zhu Xiaolei

鲍凌峰
Bao Lingfeng

况 琨
Kuang Kun

万志远
Wan Zhiyuan

引进教师 New Faculty Members

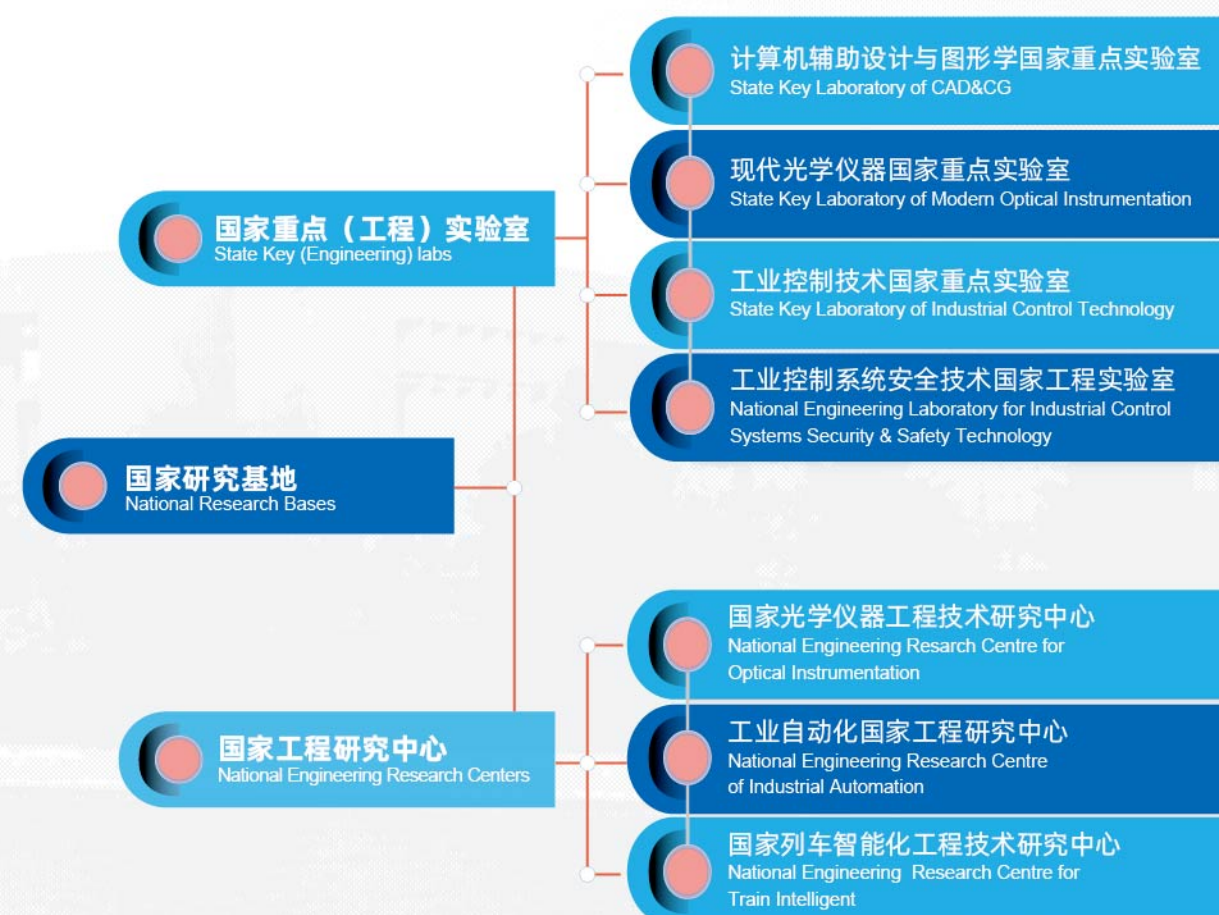|								
巴钟杰	鲍凌峰	曹云琦	陈柳青	陈璐	程凌博	崔兆鹏	韩于冰	黄崇文
Ba Zhongjie	Bao Lingfeng	Cao Yunqi	Chen Liuqing	Chen Lu	Cheng Lingbo	Cui Zhaopeng	Han Yubing	Huang Chongwen
姜燕丹	李 欢	李纪为	李钧颖	李 鹰	林 晓	林 星	刘金飞	刘 柳
Jiang Yandan	Li Huan	Li Jiwei	Li Junying	Li Ying	Lin Xiao	Lin Xing	Liu Jinfei	Liu Liu
卢 立	陆豪健	罗宇轩	骆季奎	马 蔚	毛宇尘	钱浩亮	佘小健	宋 爽
Lu Li	Lu Haojian	Luo Yuxuan	Luo Jikui	Ma Yu	Mao Yuchen	Qian Haoliang	She Xiaojian	Song Shuang
唐华锦	万志远	王东霞	王冠云	王竟亦	王贤迪	王作佳	魏 准	向 为
Tang Huajin	Wan Zhiyuan	Wang Dongxia	Wang Guanyun	Wang Jingyi	Wang Xiandi	Wang Zuojia	Wei Zhun	Xiang Wei
许海涛	杨倩倩	杨怡豪	杨 易	杨子祺	杨宗银	叶 琦	俞泽杰	詹启伟
Xu Haitao	Yang Qianqian	Yang Yihao	Yang Yi	Yang Ziqi	Yang Zongyin	Ye Qi	Yu Zejie	Zhan Qiwei
张新民	张旭鸿	章 敏	赵俊博	赵 立	赵 亮	赵永望	赵昱达	周成伟
Zhang Xinmin	Zhang Xuhong	Zhang Min	Zhao Junbo	Zhao Li	Zhao Liang	Zhao Yongwang	Zhao Yuda	Zhou Chengwei

科学研究
Scientific Research

2020年度财务到校科研经费逾11亿，纵向占比63%（含军工），其中国家自然科学基金共获批97项，合计经费9119万元，包含杰青1项，优青2项，重大重点以及联合基金重点项目共17个。被SCI收录论文有792篇，其中高水平论文约60%，已获授权发明专利527项。获教育部高等学校自然科学，CCF科学技术奖，中国光学十大进展等奖励共6项。

In 2020, the total research funding of FIT reached over 1100 million RMB. 97 grants with the amount up to 91 million RMB were approved by the National Natural Science Foundation of China （NSFC），including 1 project for distinguished young scholar, 2 projects for excellent young scholar and 17 vital important projects . 792 papers were indexed by SCI and 527 national patents have been approved this year. Several projects achieved significant progress such as National science Award of MOE and CCF Sci. & Tech Award for Technology Invention.

国家研究基地 National Research Bases

国家重点（工程）实验室
State Key (Engineering) labs

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

国家研究基地
National Research Bases

国家工程研究中心
National Engineering Research Centers

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

研究所 Institutes

学 院 College of	研究所名称 Institute	所 长 Director
光电科学与工程学院 Optical Science & Engineering	光学工程研究所 Inst. of Optical Engineering	白 剑 Prof. Bai Jian
	光学成像与检测技术研究所 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 & 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
	微纳电子研究所 Inst. of Micro Electronics and Nanoelectronics	程志渊 Prof. Cheng Zhiyuan
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	张 明 Prof. Zhang Ming
控制科学与工程学院 Control Science and Engineering	工业控制研究所 Inst. of Industrial Process Control	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
计算机科学与技术学院 Computer Science and Technology	人工智能研究所 Inst. of Artificial Intelligence	吴 飞 Prof. Wu Fei
	计算机软件研究所 Inst. of Computer Software	陈 刚 Prof. Chen Gang
	计算机系统结构与网络安全研究所 Inst. of Computer System and Security	何钦铭 Prof. He Qinming
	现代工业设计研究所 Inst. of Modern Industrial Design	孙守迁 Prof. Sun Shouqian
生物医学工程与仪器 科学学院 Biomedical Engineering & Instrument Science	生物医学工程研究所 Inst. of Biomedical Engineering	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
	医疗健康信息工程研究所 Inst. of Medical and Health Information Engineering	叶学松 Prof. Ye Xuesong

科研亮点 Research Highlights

1. 学部个推青年创新奖 Youth Innovation Awards

杨宗银 研究员
信电学院

研究方向： 半导体光电子学及其应用

简介： 主要从事基于带隙渐变半导体材料的全光谱发光和探测研究。开发了世界上最小光谱仪该光谱仪可用于单细胞高光谱成像、光谱监测和筛选。目前已在SCI期刊上发表论文32篇，其中以第一作者在Science（2篇）、Nano Letters（2篇）和 Journal of the American Chemical Society等顶级期刊上发表论文5篇。在Springer出版社合作出版著作1部。授权中国专利8项，申请英国专利1项，PCT国际专利1项。担任Frontiers in Chemistry专题编辑，以及Nature Nanotechnology和JACS等期刊的审稿人。

Full Spectrum Optoelectronics in Bandgap-graded Semiconductor Materials

The researcher focuses on the development of bandgap-graded materials in the field of optoelectronics. He has been a key pioneer in the field of bandgap-graded nanowires Furthermore, he has been a leader in defining directions and demonstrating applications of bandgap-graded nanomaterials。He has 32 publications in peer reviewed international journals (including 2 in Science as the first author), 1 book chapter, 6 conference proceedings, 8 granted Chinese patents, 1 UK patent application, 1 PCT patent. The results have been widely covered by technical and general press. His articles have been cited 1400 times with h-index and 10-index of 20 and 23 (Google Scholar), respectively. He is a regular reviewer of most of the top journals in materials and optoelectronics, including Nature Nanotechnology, JACS.
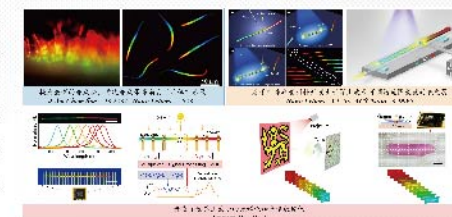

研究方向： 人工智能与网络系统安全

简介： 主要从事人工智能与网络系统安全方面的交叉研究工作，提出了智能系统安全性、鲁棒性与可用性分析和量化方法，设计了一系列智能系统脆弱性评估与安全加固机制，研制了智能系统安全性与可靠性分析评估平台。相关技术发现智能系统0-日漏洞数百个，应用于阿里巴巴、华为等大型平台，被权威媒体多次报道。主持基金重点项目、国家重点研发计划课题等多项，发表论文100余篇，含CCF A类论文60余篇，获最佳/优秀论文奖8项。

纪守领 研究员
计算机学院

AI and Network System Security

The researcher focuses on the intersection of AI and network system security. He proposed several methods for analyzing and quantifying the security, robustness and utility of AI systems, and designed a series of mechanisms for evaluating the vulnerability of AI systems and further securing them. He also developed an open-source platform for AI security and reliability analysis. Leveraging the proposed techniques, several hundreds of 0-day vulnerabilities have been discovered. Meanwhile, the developed technologies and systems have been deployed on large-scale commercial platforms, including Alibaba and Huawei. His research was partially supported by NSFC and the National Key Research and Development Program.
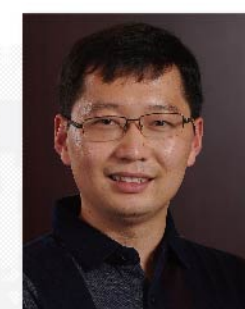
研究方向： 新型发光二极管及器件物理

简介： 主要从事新型光电子器件及器件物理方向的研究工作，近年的主要学术贡献是创造了溶液法OLED与钙钛矿LED的效率纪录，并探索了这些新型发光器件的发光原理。入选浙江省"鲲鹏行动"计划首批专家、国家级人才计划，获《麻省理工科技评论》全球"35岁以下科技创新35人"(2019)、中国"35岁以下科技创新35人"(2018)、世界顶尖科学家论坛青年科学家(2020)等荣誉。作为第一或通讯作者，在Science、Nature Photonics（封面文章）、Nature Electronics（封面文章）、Nature Communications等重要期刊发表论文，被Nature系列、中央电视台等多家权威媒体报道与评论。

Next-generation Light-emitting Diodes and Device Physics

The researcher focuses on novel optoelectronic devices and device physics. He and his co-workers set efficiency records for organic and perovskite LEDs, and explored high-efficiency light emission mechanisms in these novel devices. He has received important awards and honors, including Fellow of the Kun-Peng Program of Zhejiang Province, Young Scholar of the National Talent Program, MIT Technology Review Innovators Under 35 (global & China), and World Laureates Forum Young Scientist. He published his research in top-tier journals including Science, Nature Photonics (cover article), Nature Electronics (cover article) and Nature Communications.

狄大卫 研究员

光电学院
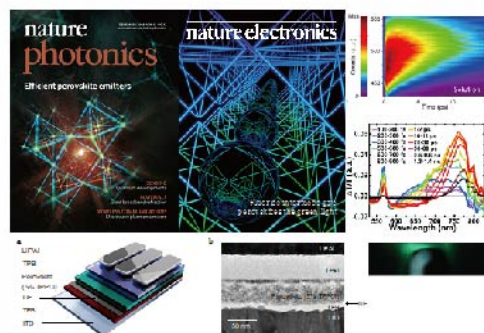
2. 新增科研基地 | New Research Key Base

浙江省区块链与网络空间治理重点实验室

实验室获批于2020年，计算机学院任奎教授担任主任。实验室将围绕区块链、网络空间治理等展开深度研究，重点突破区块链和网络空间治理基础理论瓶颈，建立全面国产、自主、可控的区块链技术体系，形成监管友好、全流程、全方面的区块链监管标准和评估体系。

### Zhejiang Provincial Key Laboratory of Blockchain and Cyberspace Governance

The Lab directed by Prof. Kui Ren from CCST was established in 2020. The research of the lab centers around five key areas, i.e., Cryptography for blockchain, Consensus technology, Smart contract systems, System security and regulation, and Trustworthy governance in cyberspace. The overarching goal of the lab is to lay a solid theory foundation for blockchain technology and cyberspace governance, establish regulatory-friendly governance and application systems, and foster technology domestication and independence.

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

① 广域协同的高端大规模可编程自动化系统及应用

控制学院王文海教授领衔的该项目获得重大突破性进展。项目针对国家智能工厂重大需求，突破了总体设计、综合安全、感知优化、运行优化等四大技术难题，成功研发出以控制协同、安全可靠、网络增强、运行优化为特征的广域协同的高端大规模可编程自动化系统，在能源、冶金、石化、环保等行业推广应用4000余套。

Wide-area Collaborative High-end Large-scale Programmable Automation System and Its Application

In view of the major needs of national smart factories, the project, directed by Prof. Wang Wenhai from CCSE, has made breakthroughs in four major technical problems: the overall design technology, the comprehensive security technology of safety & security, the perception optimization technology and the operation optimization technology. This project has developed wide-area collaborative high-end large-scale programmable automation system and realized industrialization and large-scale promotion of more than 4,000 sets in energy, metallurgy, petrochemical and environmental protection industries.
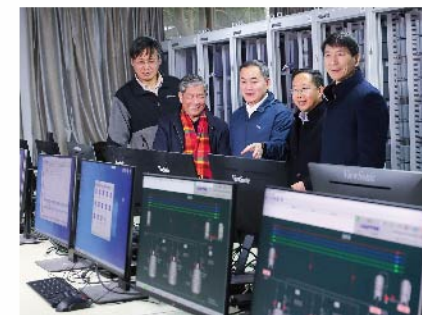
② 真实感图形的实时计算理论与方法

计算机学院周昆教授领衔的该项目获得重大突破性进展。项目组率先开展了GPU架构上的真实感图形实时计算研究，发现了三维空间层次数据结构的分解重组规律，首次创建了全GPU运行的真实感图形绘制流水线，形成了数据并行的贯穿图形表示、真实感建模、绘制计算全过程的理论体系，开拓了从CPU到GPU的真实感图形计算新方向。

### Theory and Method of Real-time Computing of Realistic Graphics
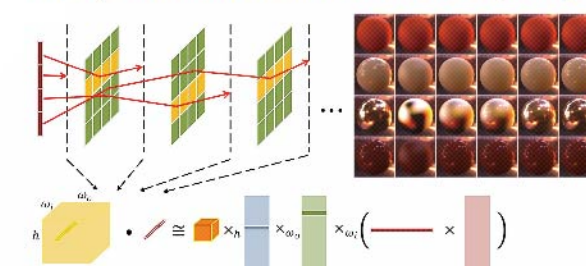
The project led by Prof. Zhou Kun from CCST is among the first groups to exploit the general-purpose GPU architecture for real-time computing of realistic graphics. The team discovers the partitioning and compacting rules of nodes and graphical primitives in spatial hierarchies. All achievements have formed a theoretical system that covers the entire process of data-parallel graphics representation, computational modeling, and realistic rendering, which has opened up a new direction for advancing realistic graphics computing from CPUs to GPUs.

③ 电磁隐身衣的机理及实验研究

由信电学院陈红胜教授负责的该项目获2020年教育部高等学校自然科学一等奖。项目针对隐身衣与电磁波相互作用的物理机理尚不明确、隐身衣的构成参数苛刻以及隐身衣的难以实现宽频隐身等科学问题开展研究，在理论上深刻揭示了隐身衣与电磁波相互作用的物理机理，创新性地提出了均匀变换光学隐身设计新方法，提出了大尺度宽频隐身的设计新思想并进行了实验验证。相关研究成果被多家国际知名科技杂志做专题报道。

Research on Mechanism and Experimental Validation of Invisibility Cloak

The project directed by Prof. Chen Hongsheng from ISEE won the 1st prize of the Natural Science Award of MOE in 2020. This project aims at the scientific problems such as the physical mechanism of the cloak, the rigorous constitutive parameters requirement of the cloak, and the difficulty in realizing broadband macroscopic cloak. It revealed the mechanism of the interaction between cloak and electromagnetic wave, proposed a new design method of homogeneous transformation optics and experimentally validated the large scale broadband invisibility cloak. The related works have been highlighted by many scientific magazines and public media.
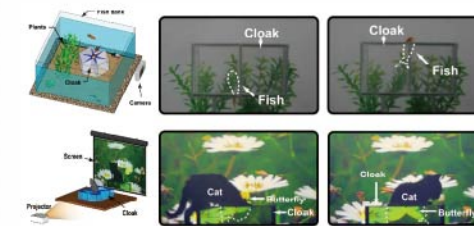
④ **面向数字经济的可视化设计与开发关键技术及应用**

由计算机学院陈为教授负责的该项目获2020年CCF科学技术技术发明一等奖。项目历经十余年持续攻关，在面向数字经济的可视化设计与开发技术上于复杂数据的可视表达、高效能可视化技术、低代码可视化设计、敏捷可视查询与分析等多个方面取得了重要突破，解决了传统的可视化工具局限于小规模静态数据，难以应对数据模态多样、用户认知模糊、应用需求多变的难题，成功研发可视化交互设计与开发软件平台，应用于阿里集团各业务线、城市大脑、新华网、中央电视台等单位。新增产值累计超3亿元。

Key Technologies and Applications of Visualization Design and Development for Digital Economy

The project directed by Prof. Chen Wei from CCST won the 1st prize of the 2020 CCF S&T Award for Technology Invention. After more than ten years of continuous research, the project has made breakthroughs in the visual expression of complex
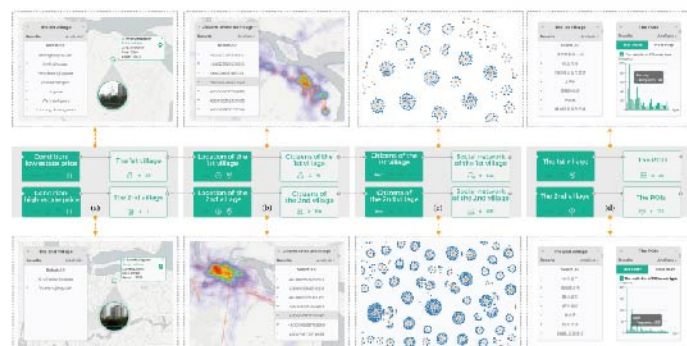
data, high-performance visualization technology, low-code visualization design, and agile visual query and analysis in terms of visualization design and development technology for the digital economy. This project solved the problems of traditional visualization tools being limited to small-scale static data, which is difficult to cope with diverse data modalities, fuzzy user cognition, and changing application requirements. The developed design of visual interaction and software platform was applied to Alibaba Group Business Lines, City Brain, Xinhua Net, CCTV, etc. The cumulative new output value exceeds 300 million yuan.

⑤ **数据库理论与系统**

由计算机学院高云君教授负责的该项目获批2020年国家杰青基金资助。他主要从事数据库、大数据管理与分析、DB与AI融合的研究。本项目拟重点研究多源异构大数据智能整合、基于人工智能的数据处理技术和基于数据库的人工智能优化三个核心问题，并搭建多源异构大数据智能处理平台，致力于建立面向大数据智能的多源异构数据处理理论与方法体系。

Database Theory and Systems

The project, directed by Prof. Gao Yunjun from CCST, was supported by NSFC for Distinguished Young Scholar in 2020. Prof. Gao's group has been doing lots of work on database, big data management and analytics, and fusion of DB and AI. The project will focus on multi-source heterogeneous big data intelligence integration, artificial intelligence powered database technologies, and database driven artificial intelligence optimization. Last but not the least, the project aims to build a multi-source heterogeneous big data intelligence processing platform. The objective is to establish big data intelligence oriented multi-source heterogeneous data processing theory and method system.

⑥ **光学自由曲面光束调控**

由光电学院吴仍茂研究员负责的该项目获批2020年国家优秀青年基金资助。高性能、新功能以及小型化是现代光束调控系统的必由之路。本项目拟开展非成像自由曲面非零光展度光束调控机理与方法研究，旨在揭示光学曲面对非零光展度光束能量传输的调控机理，建立自由曲面非零光展度光束调控理论体系，并面向关键应用优化核心算法及性能指标，开展多光源集成、空间受限的自由曲面非零光展度光束调控新体制和应用研究。
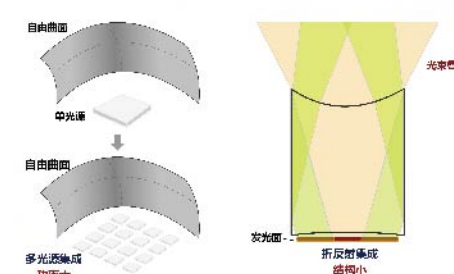
**Light Manipulation by Freeform Optical Surfaces**

The project, directed by Researcher Wu Rengmao from COSE, was supported by NSFC for Excellent Young Scholar in 2020. High performance, miniaturization, and new functions are the ultimate development goal of modern optical systems. The proposed project will focus on fundamental theories and associated new regulation mechanisms of redirecting light beam with non-zero étendue by freeform optical surfaces. This project not only provides the theoretical support and technical guidance for beam shaping with freeform optics, but also has great prospects and wide application possibilities in the energy-efficient lighting and laser beam shaping in the near future.

⑦ **计算机图形学与虚拟现实**

由计算机学院吴鸿智副教授负责的该项目获批2020年国家优秀青年基金资助。他主要从事高密度光源采集装备和可微分建模算法的研究。本项目拟重点研究基于高维物理采样的BSSRDF建模，包括基于间接测量样本的BSSRDF可计算性理论、基于高维先验的最优采样与重建、高性能多物理维度采集硬件架构、高维物理域的多路复用以及高维物理样本的鲁棒建模方法等，致力于实现对BSSRDF的高效高质量采集重建。

Computer Graphics and Virtual Reality

The project, directed by Assoc. Prof. Wu Hongzhi from CCST, was supported by NSFC for Excellent Young Scholar in 2020. Wu's research focuses on acquisition devices of high-density illuminations and differentiable modeling methods. This project will focus on the research of BSSRDF modeling based on high-dimensional physical samples, including the computation theory of BSSRDF from indirect measurements, optimal sampling and reconstruction with high-dimensional priors, high-performance multi-physical-dimensional acquisition hardware architectures, multiplexing in the high-dimensional physical domain, and robust modeling methods from high-dimensional physical samples. The project is dedicated to make it possible for highly efficient and high-quality acquisition and reconstruction of BSSRDF.
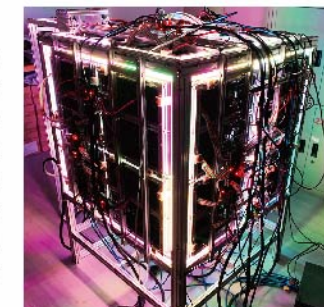
⑧ **基于光子集成芯片的多参量高通量免标记生物分子检测仪**

由光电学院何建军教授负责的该项目获批2020年基金委重大科研仪器研制项目资助。项目研制高灵敏度硅基双环谐振腔传感器阵列芯片以及与光传感芯片集成的微流通道及其控制系统，研制一款可用于肿瘤、传染病毒、细菌等生物分子检测的光学仪器，从而可以实现对一个微量样品中多种不同生物分子的同时、原位、高选择性、高灵敏度、免标记的快速检测，为疾病诊断、食品安全分析、环境污染检测等提供可产品化的仪器。
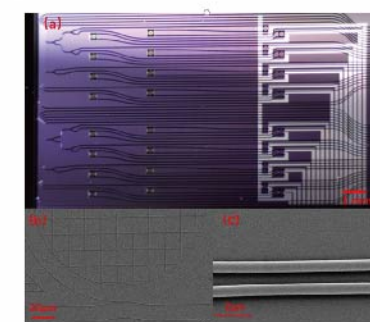
Multi-Parameter High-Throughput Label-Free Biomolecule Detection Instrument Based on Photonic Integrated Chip

The project, led by Prof. He Jianjun from COSE, was supported by the NSFC Major Research instrument Program in 2020. The project is to develop a high-sensitivity silicon-based dual ring resonant cavity sensor array chip, as well as the microfluidic channel and its control system integrated with the optical sensor chip, and realize an optical instrument for the detection of tumor, infectious virus, bacteria and other biological molecules. the photonic integrated chip can reduce the sample consumption, shorten the detection time, reduce the cost, and realize simultaneous, in situ, high selectivity, high sensitivity and label free rapid detection of a variety of different biomolecules in a micro sample, and provide instruments for disease diagnosis, food safety analysis, environmental pollution detection, etc.

⑨ 车联网移动电磁环境效应宽带测试技术与仪器研究

由信电学院李尔平教授负责的该项目获批2020年基金委重大研究计划资助。项目针对车联网设备随着5G通信发展即将进入产业化急需先进专用电磁环境效应测试仪器的需求，亟待突破车联网在运动状态下电磁环境全生命周期时空场景评估以及测试的技术瓶颈，旨在解决运动状态下车联网电磁环境效应测试存在的三大关键科学难题，实现我国在车联网这一高新技术领域的国际引领。

Broadband Measurement Technology and Instrument for Mobile Electromagnetic Environmental Effect of Internet of Vehicles
The project, led by Prof. Li Erping from ISEE, was supported by the NSFC Major Research Program in 2020. This project is postulated to carry out research on the testing technology and instruments of the electromagnetic environment for Internet of Vehicles in view of the increasing of complex electromagnetic environment problems in Internet of Vehicles technology in recent years.

⑩ 无标记受激辐射寿命成像介导的活体肿瘤微环境调控研究

由光电学院丁志华教授负责的该项目获批2020年基金委重点项目资助。项目研发以调控宫颈组织溶氧量、酸碱度等为目标的纳米载运体系，构建内窥式寿命成像系统，开展高度定量化的细胞代谢途径精准描述，实现宫颈癌微环境调控水平的定量评价和反馈。其开辟的非荧光物质的寿命成像新技术，为阐明肿瘤细胞的耐药、优化和创新宫颈癌治疗手段提供了一种全新的思路。
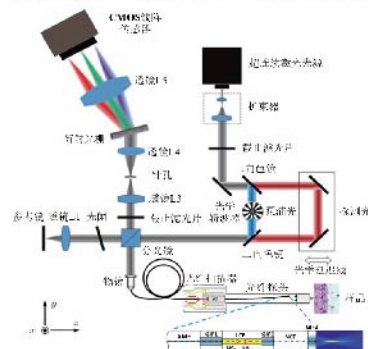
In Vivo Detection of Tumor Microenvironment Regulation Via Label-free, Stimulated-emission Based Lifetime Imaging
The project, led by Prof. Ding Zhihua from COSE, was supported by the NSFC Key Program in 2020. The project will develop nano-materials aiming at adjusting oxygen concentration and pH value of cervical tissues, build the lifetime imaging endoscope, and perform highly-quantitative characterization of cellular metabolism, so as to obtain quantitative feedback of regulation ability of the nano-materials in cervical cancer. This project provides a scheme that enables lifetime imaging for non-fluorescent specimens, and provides new insights into understanding drug-resistance, as well as improving and/or developing treatments for cervical cancer.

⑪ 隐私保护的细粒度无线感知技术

由计算机学院任奎教授负责的该项目获批2020年基金委重点项目资助。项目开展基于无线信号的细粒度感知研究，消除图像等隐私泄露风险，并结合机器学习和对抗网络等技术，对从感知到认知的全过程进行隐私保护和安全加固，突破重点关键技术。通过平台验证和在安全监控等领域的示范应用，在支撑关键智能应用的同时也为用户提供可控可靠的全面隐私保护。

Privacy-preserving Fine-grained Wireless Sensing Technologies
The project, led by Prof. Ren Kui from CCST, was supported by the NSFC Key Program in 2020. This project will take advantages of the fine-grained wireless sensing and eliminate the privacy risks, e.g., images leakage. In the meantime, leveraging the technologies of machine learning and adversarial networks, researchers will comprehensively protect the privacy and enhance the security from sensing to recognition. Through the validation on testbeds and demonstration implementation in the surveillance and other sensing applications, This project will realize the privacy-preserving fine-grained wireless sensing technologies that support key intelligent applications and provide a controllable, reliable, and full-range protection on users' private information.
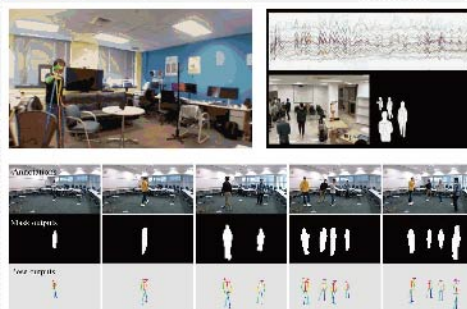
⑫ 面向在线教育的群体智能支持下人机协同学习研究

本项目由计算机学院吴飞教授领衔，获2020年基金委重点项目资助。项目以"群体智能可计算建模、人在回路可进化学习、协同学习可归因测评"这一思路对大规模在线教育基础理论、模型算法和实现手段进行研究。面向在线教育场景，在现有机器学习中引入群智交互模型，建立人在回路的机器学习框架，构建由果溯因的协同学习测评方法，充分协调数据驱动下归纳、知识指导中演绎以及群体认知中顿悟等不同学习手段和方法等。

Human-machine Collaborative Learning via Crowd Intelligence for Online Education
This project, led by Prof. Wu Fei from CCST, was supported by the NSFC Key Program in 2020. This project will research how the crowd intelligence is embarked, what the human-in-the-loop is and how to evaluate the online learning results. Moreover, this project attempts to devise a more appropriate way to integrate data-driven induction, knowledge-guided deduction and exploration-exploitation crowd cognition together for massive online education application. This project will advance the interdisciplinary endeavors of artificial intelligence, education and social science and result in both theoretical and practical significance.

⑬ 机器学习辅助的EDA后端设计关键技术和工具链研究
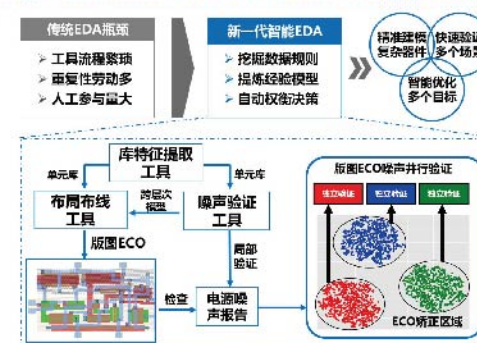
由信电学院卓成研究员负责的该项目获批2020年基金委重点项目资助。项目从布局布线，电源网噪声验证和库特征提取等三方面着手，研究多环节/多目标关联性建模，大规模网络降维压缩和物理机制驱动的高效器件模型等关键共性技术，通过机器学习技术和多工具协同突破原有设计瓶颈，以满足未来芯片后端设计精准建模、智能优化、快速验证的发展需求。

Machine Learning Assisted EDA Back-End Design Technology and Tool Chain
The project, led by Researcher Zhuo Cheng from ISEE, was supported by the NSFC Key Program in 2020. With focuses placed on placement/routing, power grid noise verification, and library characterization, the project plans to investigate a few key techniques including multi-stage/multi-objective connection modeling, large network compression, physical mechanism-driven device modeling, etc. With such innovations, this project is expected to break the design bottleneck through machine learning and multi-tool collaboration, and meet the various demands on modeling, optimization and verification for future chip back-end design.

⑭ 光电集成深移频超分辨芯片及其在活细胞蛋白质聚集研究的应用

由光电学院杨青教授负责的该项目获批2020年重点国际合作项目资助。项目针对超分辨显微多功能化和集成化的关键需求，探索面向片上移频超分辨显微的频谱全覆盖、兼容荧光标记和无标记的可调谐深移频成像机理，研制30nm量级的荧光标记和无标记可调深移频超分辨成像光子集成芯片，发展可调深移频超分辨图像重构算法，同时将电学刺激和信息收集功能集成到成像芯片上，为研究神经细胞膜附近淀粉样蛋白聚集现象以及与之相关的阿兹海默症病理提供多功能研究平台。
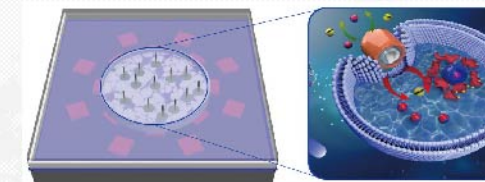
Tunable Deep Frequency Shift Based Optoelectronic Integrated Super-resolution Chip and Its Applications to Study Amyloid Aggregation in Live Cells
The project, led by Prof. Yang Qing, was supported by the NSFC collaborative research program in 2020. The project is desired for the critical requirements of multi-function and integration of super-resolution imaging. The research includes: 1. Exploring the on-chip tunable deep spatial frequency shift super-resolution imaging mechanism with full coverage of the spatial spectrum, compatibility with fluorescent labeled and label-free imaging. 2. Fabricating 30-nm-resolution labeled and label-free tunable deep spatial frequency shift super-resolution imaging photonic integrated chip. 3. Developing tunable deep spatial frequency shift super-resolution imaging algorithm. 4. Integrating electrical stimulation and information collection functions into the imaging chip. It will provide a multifunctional research platform to study the phenomenon of amyloid aggregation in vicinity of nerve cell membranes and the related Alzheimer's pathology.

⑮ **基于接触−社交图谱的传染病传播建模、分析与预测**

由控制学院贺诗波教授负责的该项目获批2020年国际(地区)合作与交流项目资助。项目基于数据智能对以新冠肺炎为代表的重大传染病疫情防控进行赋能，刻画重大传染病传播的时空特征，研究基于社交网络图谱的传染病传播特性和态势评估，设计基于物理接触图谱的传染病传播预测方法，最终形成基于接触−社交图谱的综合疫情预测理论。本项目的实施有望从数据智能角度发现重大传染病防控的新思路和新方法。

Explore Physical - social Contact Graph for Spreading Modeling, Analysis and Prediction of Infectious Diseases
The project, led by Prof. He Shibo from CCSE, was supported by the NSFC collaborative research program between China and Korea in 2020.The project empowers the process of epidemic prevention and control by the data intelligence: characterize the spatial-temporal spreading pattern, analyze and predicting COVID-19 related information spread on online social media, predicting the future case situation using contact graph, and predict COVID-19 situations based on the contact social graph. The implementation of this project is expected to reveal brand-new ideas and methods for the prevention and control of emerging infectious diseases from the perspective of data intelligence.

⑯ **大规模移动边缘网络智能协同感知−接入−处理理论与方法**

由信电学院张朝阳教授负责的该项目获批2020年基金委联合基金项目资助。项目针对大规模移动边缘网络在智慧城市和智能制造等任务场景下的实时性、可靠性、效率需求，建立感知、通信与计算协同的移动边缘网络新型架构，探索移动边缘网络的有效综合性能度量和限界，深入挖掘感知数据的特征和规律，自主学习信道和网络环境的统计特性，协调利用通信和计算资源，建立任务图/算法图和数据/事件驱动的感知−通信−计算的智能协同机制，从而显著提升边缘网络综合服务性能和资源效率，以满足时延敏感、资源受限的未来大规模移动边缘网络的应用需求。

Intelligent and Synergetic Sensing, Access and Processing in Large-Scale Mobile Edge Networks
The project, led by Prof. Zhang Zhaoyang from ISEE, was supported by the Joint Fund of the NSFC in 2020. This project is to fulfill the real-time, reliability and efficiency requirements for large-scale mobile edge networks in application scenarios like smart city and smart manufacturing. An integrated architecture is constructed with intelligent sensing, reliable access and distributed processing, and the effective measures and the related bounds are investigated to reflect its overall performance. By exploiting the features hidden in the sensed data and learning the channel and environment statistics, the radio and computing resources are jointly utilized and optimized for distributed processing. This way, an intelligent and synergistical mechanism for sensing, communication and computation greatly improves the overall service quality and resource utilization of mobile edge networks, in order to fulfill the application requirements for delay-sensitive resource-limited future large-scale mobile edge networks.
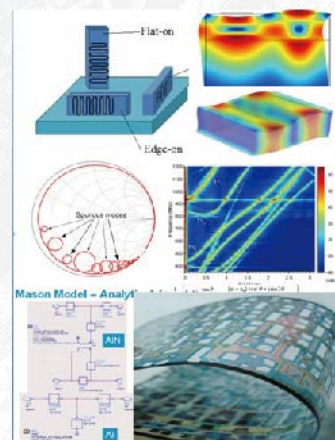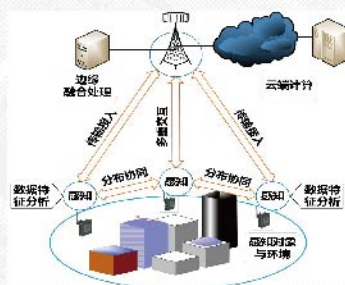
⑰ **基于PVDF的柔性BAW射频滤波器技术研究**

由信电学院董树荣教授负责的该项目获批2020年基金委联合基金项目资助。项目针对目前BAW不能满足5/6G通信需求的挑战，从PVDF新材料、聚合物柔性集成工艺和新型PVDF滤波器多方面入手突破目前BAW体系限制，研究基于PVDF的柔性BAW射频滤波器技术，发展全新的具有自有知识产权的柔性BAW新技术，满足未来通信大带宽、大功率和高频化的滤波器需求。

Flexible BAW Radio Frequency Filter Technology Based on PVDF
This project, led by Prof. Dong Shurong from ISEE, was supported by the Joint Fund of the NSFC in 2020. In view of the challenge that the current BAW cannot meet the 5 / 6G communication demand, The project is desired to break the physical limit from PVDF new materials, polymer flexible integration process and new PVDF BAW filter. The project studies the flexible BAW radio frequency filter technology based on PVDF with own intellectual property rights to meet the future communication filter demand of large bandwidth, high power and high frequency.

⑱ **面向不确定演化的服务生态系统设计理论与方法**
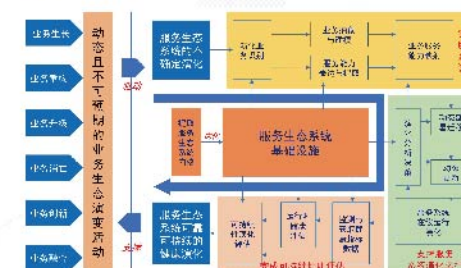
项目由计算机学院邓水光教授领衔，获2020年基金委联合基金项目资助。打造开放共享的服务生态系统是大型互联网企业的重要战略方向。项目探索业务领域开放及边界不确定的业务抽象机理，研究服务生态系统持续演化的可靠保障方法，突破数据驱动的服务生态系统健康监测与评估方法，研制支撑工具与系统，选择拥有亿级用户、百万个软件服务的阿里电商服务生态系统展开应用验证，为大型互联网企业的服务生态发展提供理论依据和技术参考。

Theories and Methods for the Design of Service Ecosystem with Uncertain Evolution
This project, led by Prof. Deng Shuiguang from CCST, was supported by the Joint Fund of the NSFC in 2020. The project explores the abstract mechanism of service ecosystem to the open business areas and uncertain boundaries, studies the reliable guarantee methods of evolution to support the rapid and sustainable growth of service ecosystems, and breaks through the data-driven health monitoring and assessment mechanism of service ecosystems. This project is supposed to provide a theoretical basis and technical reference for the development of the service ecosystem of major Internet companies.

⑲ **人工智能安全模型与测试方法**

由计算机学院秦湛研究员负责的该项目获批2020年基金委联合基金项目资助。项目聚集于人工智能安全模型与测试，构建具有可解释性与可预测性的人工智能安全理论基础与体系框架和智能体在训练和推理过程中安全防护机制与智能体安全保障技术体系，构建部署可认证的智能系统安全评估方法与测试平台。

Artificial Intelligence Security Model and Testing Methods
This project, led by Researcher Qin Zhan from CCST, was supported by the Joint Fund of the NSFC in 2020, focuses on the security model and testing methods of artificial intelligence. The project is targeted to build the theoretical basis and system framework of AI security with interpretability and predictability and the security protection mechanisms & support technology in the process of training and reasoning and deploy the certifiable intelligent system Unified security assessment method and test platform.

⑳ **基于异步通讯架构的百万级神经元类脑计算芯片关键技术研究**

由计算机学院马德副教授负责的该项目获批2020年基金委联合基金项目资助。项目聚焦于基于异步通讯的大规模类脑计算芯片架构研究，能够支持单芯片集成百万级神经元，级联构建亿级神经元类脑计算系统。主要从神经元节点、拓扑结构、通讯机制和在线学习几个方面展开研究。

Key Technologies of Millions Spiking-neuron Integrated Circuit with Asynchronous Communication Architecture
The project, led by Associate Prof. Ma De from CCST, was supported by the Joint Fund of the NSFC in 2020. This project plans to propose a large-scale neuromorphic architecture based on network-on-chip with asynchronous communication, which can support the integration of millions of neurons on a single chip, and supports chip level's scaling to build neuromorphic system with hundreds of millions of neurons. The Research will focus on neuron nodes, topology, communication mechanism and online learning, etc..
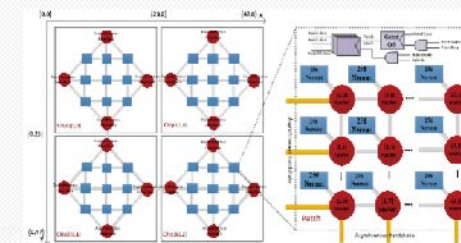
㉑ 复杂电商环境下自主高效可泛化的神经网络模型研究

由计算机学院李玺教授负责的该项目获批2020年基金委联合基金重点项目资助。项目重点聚焦面向复杂电商环境下的神经网络模型研究，拟从学习机理、模型安全和可解释推理等角度切入，建立面向复杂电商环境的自主高效可泛化的神经网络模型，促使数字经济向更加智能和安全的方向发展。

### Research on Efficient and Autonomously Generalizable Neural Network Models for Complex E-Commerce Environments

This project, led by Prof. Li Xi from CCST, was supported by the Joint Fund of the NSFC in 2020. The project focuses on the research of neural network models for complex e-commerce environments. The project will eventually establish efficient and autonomously generalizable neural network models for complex e-commerce environments, promoting the development of the digital economy in a more intelligent and secure direction.

㉒ 不确定环境下小样本目标识别理论和方法

由计算机学院宋明黎教授负责的该项目获批2020年基金委联合基金项目资助。本项目立足于深度学习时代带来的丰富模型资源，拟从样本生成、小样本学习、零样本未知目标识别以及不确定环境下小样本目标识别四个层面展开研究，有望突破传统的机器学习范式，构建小样本学习在复杂、开放、不确定环境下的创新性理论和方法。

### Theory and Method for Object Recognition with Few Shots in Uncertain Environment
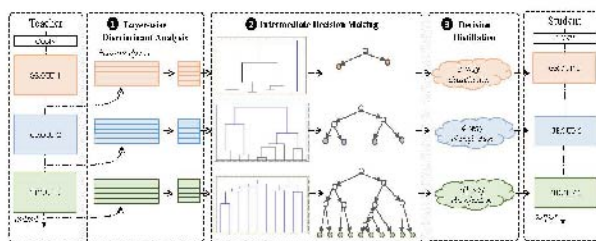
The project, led by Prof. Song Mingli from CCST, was supported by the Joint Fund of the NSFC in 2020. This project plans to conduct research from four levels: sample generation, few-shot learning, zero-shot unknown object recognition and few-shot object recognition in an uncertain environment, thus forming a complete and unified small sample machine learning framework. This project is expected to break through the traditional machine learning paradigm and build innovative theories and methods of few-shot learning in complex, open and uncertain environment.

㉓ 飞秒激光直写光波导技术及其在光互连器件的应用

由光电学院邱建荣教授负责的该项目获批2020年基金委联合基金项目资助。项目将研究飞秒激光诱导空间选择性折射率变化和分布的时空演变和物理机制，利用时空整形飞秒激光实现波导模式以及损耗的调控，实现波导传输损耗小于0.2dB/cm，耦合损耗小于0.5dB；制备光波导型互连器件，为下一代光通信奠定坚实基础。

Fs Laser Direct Writing Optical Waveguide Technique and Applications in Optical Interconnection Devices

This project, led by Prof. Qiu Jianrong from COSE, was supported by the Joint Fund of the NSFC in 2020. The project will study the spatiotemporal dynamic process and mechanism of the fs laser induced space-selective refractive index change. It will use pulse shaped fs laser to control the transmission mode and optical loss of optical waveguides, and the transmission loss will be less than 0.2dB/cm, and total coupling loss will be less than 0.5dB; It will demonstrate optical interconnected waveguide type devices, and lay a solid foundation for the next generation optical communication.
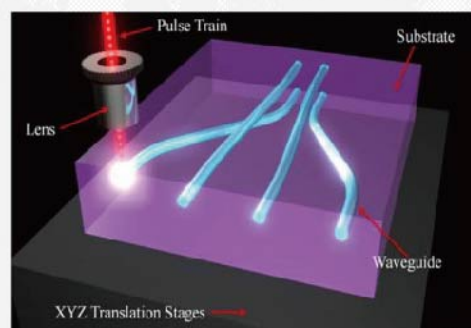
## 4. 年度代表性论文 Recommended Papers

① Deep-Learning-Enabled Self-adaptive Microwave Cloak Without Human Intervention

作者: Chao Qian; Bin Zheng, Hongsheng Chen,等

来源: NATURE PHOTONICS

卷: 14 页: 383-390 出版年: MAR 2020

In reaction to an external stimulus or non-stationary environment, our developed intelligent cloak can automatically adjust its internal active structure to remain invisible at millisecond timescale, as if the cloak were endowed with a chameleon's ability. This work will move the current cloaking research field into the next generation—intelligent cloak and impact on the established metamaterial community.
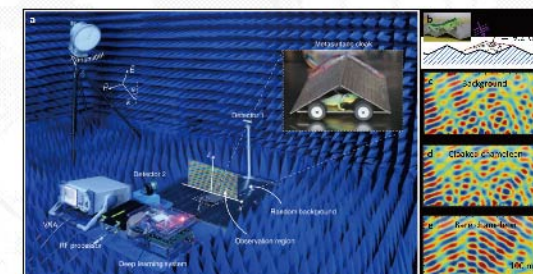
② Highly Efficient Phosphor-glass Composites by Pressureless Sintering

作者: Dao Zhang, Wenge Xiao, Jianrong Qiu, 等

来源: NATURE COMMUNICATIONS 卷: 11 期: 1 文献号: 2805 出版年: JUN 2020
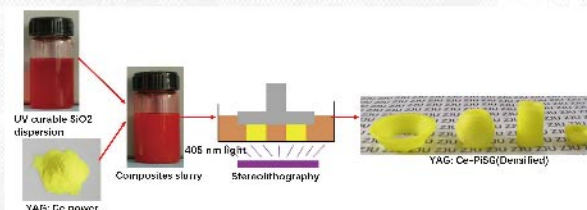
The development of high-power white light-emitting diodes demands highly efficient and stable all-inorganic color converters. We report the intrinsic inhibition of interfacial reaction by using silica glass rather than multicomponent glasses as the matrix. The embedment of phosphors is achieved via a pressureless sintering method, rendering these color-tunable phosphor-glass composites not only accessible to three-dimensional printing technique, but also highly efficient (internal quantum efficiency >90.0%), thermally stable at 1200 degrees C and hydrothermally stable at 200 degrees C. Our results provide a facile and general strategy for developing all-inorganic functional composites.

③ Deep Learning Enables Structured Illumination Microscopy with Low Light Levels and Enhanced Speed

作者: Luhong Jin, Bei Liu, Yingke Xu,等

来源: NATURE COMMUNICATIONS

卷: 11 文献号: 1934 出版年: APR 2020

Using deep learning to augment structured illumination microscopy (SIM), we obtain a five-fold reduction in the number of raw images required for super-resolution SIM, and generate images under extreme low light conditions (at least 100× fewer photons). We validate the performance of deep neural networks on different cellular structures and achieve multi-color, live-cell super-resolution imaging with greatly reduced photo bleaching.
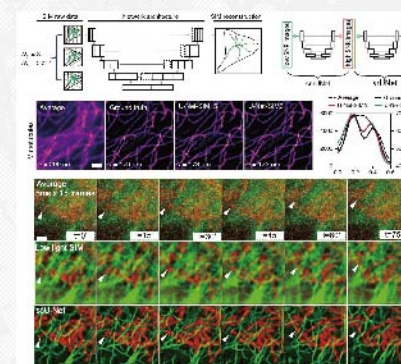
④ Towards a New Generation of Artificial Intelligence in China

作者: Fei Wu, Cewu Lu, Mingjie Zhu, 等

来源: NATURE MACHINE INTELLIGENCE 卷: 3 页: 312-316 出版年: JUN 2020

This Perspective briefly introduces the New Generation AI Development Plan of China (2015–2030) from the point of view of the authors, a group of AI experts from academia and industry who have been involved in various stages of the plan. China's AI development plan outlines a strategy for science and technology as well as education, tackling a number of challenges such as retaining talent, advancing fundamental research and exploring ethical issues. The New Generation AI Development Plan is intended to be a blueprint for a complete AI ecosystem for the country.
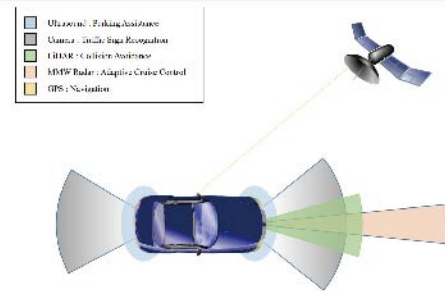
❺ The Security of Autonomous Driving: Threats, Defenses, and Future Directions

作者: Kui Ren, Qian Wang, Cong Wang, 等

来源: PROCEEDINGS OF THE IEEE

卷: 108 期: 2 页: 357-372 出版年: FEB 2020

We give a systematic study on the security threats surrounding autonomous driving, from the angles of perception, navigation, and control. We also summarize the corresponding defense strategies and discuss future research directions about the new security threats, especially those related to deep learning based self-driving vehicles. By providing the security guidelines at this early stage, we aim to promote new related techniques and boost the development of secure autonomous driving.

❻ Semiconducting Polymer Nanoparticles as Theranostic System for Near-Infrared-II Fluorescence Imaging and Photothermal Therapy under Safe Laser Fluence

作者: Yanqing Yang, Xiaoxiao Fan, Jun Qian, 等

来源: ACS NANO

卷: 14 期: 2 页: 2509-2521 出版年: FEB 2020

In this study, we reported a theranostic system based on semiconducting polymer nanoparticles (L1057 NPs) for NIR-II fluorescence imaging and PTT. The high brightness allows NPs for real-time visualization of the different kinds of blood vessels, and the excellent photothermal properties at 980 nm allow for PTT of tumors under safe laser fluence.

❼ A Self-Priming Digital Polymerase Chain Reaction Chip for Multiplex Genetic Analysis

作者: Juxin Yin, Zheyu Zou, Ying Mu, 等

来源: ACS NANO

卷: 14 期: 8 页: 10385-10393 出版年: AUG 2020

We designed and tested a self-priming digital PCR chip containing 6-plex detection capabilities using monochrome fluorescence, which has six detection areas and four-layer structures. We conclude that this technique can precisely quantify EGFR mutations in high-performance diagnostics. This multiplex digital detection chip is a simple and inexpensive test intended for liquid biopsies. It can be applied and used in prenatal diagnostics, the monitoring of residual disease, rapid pathogen detection, and many other procedures.

❽ The Gap of Semantic Parsing: A Survey on Automatic Math Word Problem Solvers

作者: Dongxiang Zhang, Lei Wang, Luming Zhang, 等

来源: IEEE TRANSACTIONS ON PATTERN ANALYSIS AND MACHINE INTELLIGENCE

卷: 42 期: 9 页: 2287-2305 出版年: SEP 2020

In this survey, we emphasize on algebraic word problems, summarize their extracted features and proposed techniques to bridge the semantic gap, and compare their performance in the publicly accessible datasets. We also cover automatic solvers for other types of math problems such as geometric problems that require the understanding of diagrams. Finally, we identify several emerging research directions for the readers with interests in MWPs.
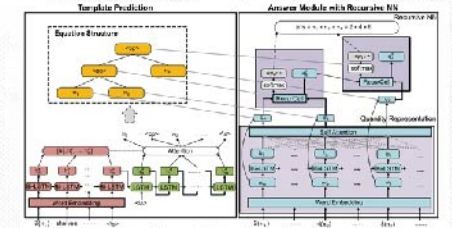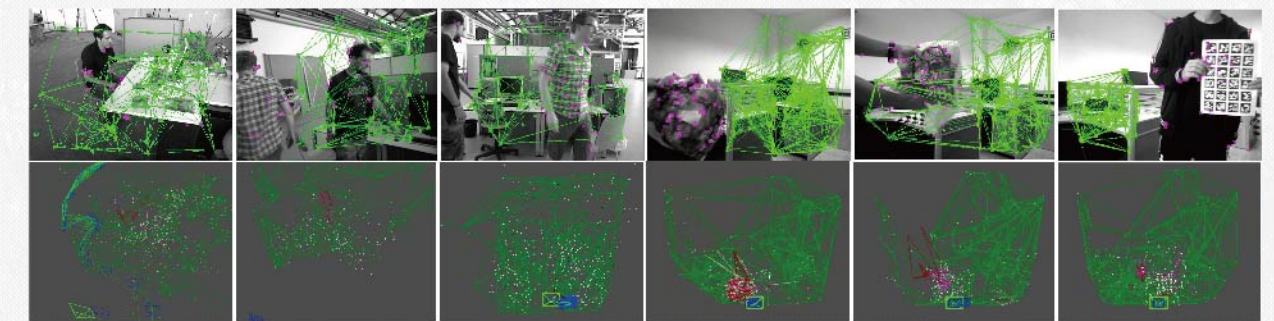
❾ RGB-D SLAM in Dynamic Environments Using Point Correlations

作者: Weichen Dai, Yu Zhang, Ping Li, 等

来源: IEEE TRANSACTIONS ON PATTERN ANALYSIS AND MACHINE INTELLIGENCE

卷: PP DOI:10.1109/TPAMI.2020.3010942 出版年: JULY 2020

The SLAM method which eliminates the influence of moving objects in dynamic environments is proposed. This method utilizes the correlation between map points to separate points that are part of the static scene and points that are part of different moving objects into different groups. Motion estimation is performed using only static map points. The experimental results demonstrate that robust and accurate performance can be achieved by the proposed SLAM method in both slightly and highly dynamic environments.
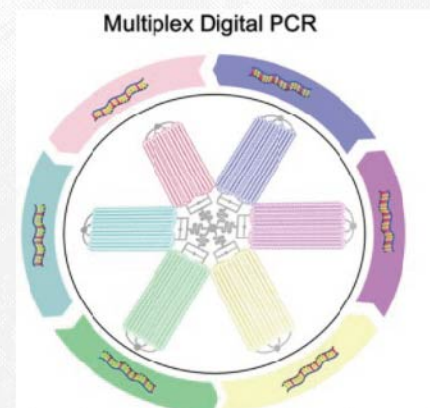
❿ Chiral Plasmons with Twisted Atomic Bilayers

作者: Xiao Lin, Zifei Liu, Fei Gao, 等

来源: PHYSICAL REVIEW LETTERS

卷: 125 期: 7 文献号: 077401 出版年: APR 2020

We present the general solutions from Maxwell equations of chiral plasmons in twisted atomic bilayers, with the consideration of interlayer quantum coupling. Twisted atomic bilayers show a direct correspondence to the chiral metasurface, which simultaneously possesses chiral and magnetic surface conductivities, besides the common electric surface conductivity. Moreover, the chiral surface conductivity, determined by the interlayer quantum coupling, determines the existence of chiral plasmons.
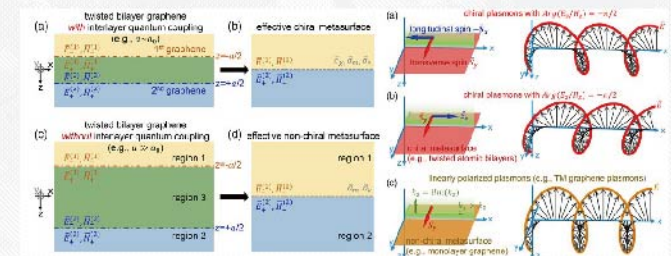
⑪ White-box Fairness Testing through Adversarial Sampling

作者: Peixin Zhang, Jingyi Wang, Xinyu Wang, 等
来源: ACM/IEEE 42nd ICSE 2020最佳会议论文
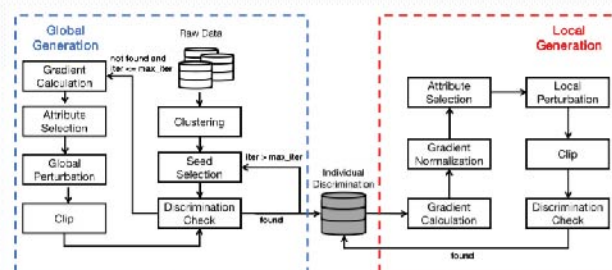会议时间: MAY 23-29, 2020; 会议地点: Seoul, South Korea

We propose a scalable approach for searching individual discriminatory instances of deep neural network, which only employs lightweight procedures like gradient computation and clustering. Experiments on several fairness benchmark datasets show that our approach explores the search space more effectively (9 times) and generates much more individual discriminatory instances (25 times) using much less time (1/7), and is helpful to improve the fairness of model through augmentation training.

⑫ Robust Cooperative Output Regulation of Heterogeneous Uncertain Linear Multiagent Systems With Time-Varying Communication Topologies

作者: Lei Wang, Changyun Wen, Zhitao Liu, 等
来源: IEEE TRANSACTIONS ON AUTOMATIC CONTROL
卷: 65 期: 10 页: 4340-4347 出版年: OCT 2020

This article investigates the robust cooperative output regulation problem for heterogeneous uncertain linear multi-agent systems, with time-varying communication topologies. Under the weaker detectability condition, a new distributed regulator via partial state feedback is first established with the addition of an integrator to the input channel. This is then extended to obtain the practical cooperative output regulation via measurement feedback with the employment of an extended high-gain observer.
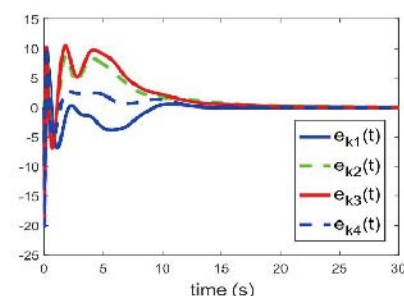
⑬ VTrace: Automatic Diagnostic System for Persistent Packet Loss in Cloud-Scale Overlay Network

作者: Chongrong Fang, Peng Cheng, Jiming Chen. 等
来源: ACM SIGCOMM 2020 浙大首篇
会议时间: AUG 10-14, 2020; 会议地点: Virtual Event, USA.
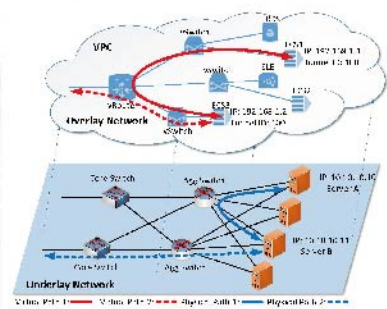
We present VTrace, an automatic diagnostic system for persistent packet loss over the cloud-scale overlay network. Utilizing the "fast path-slow path" structure of virtual forwarding devices (VFDs), e.g., vSwitches, VTrace installs several "coloring, matching and logging" rules in VFDs to selectively track the packets of interest and inspect them in depth. The detailed forwarding situation at each hop is logged and then assembled to perform analysis with an efficient path reconstruction scheme. We share experiences in Alibaba Cloud for over 20 months.

人才培养
Education

　　学部共有10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，15个本科专业，其中：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个专业为国家级一流本科专业建设点。在校生（包含本科生和研究生）8967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 10 doctorate programs of primary discipline, 22 doctorate programs of secondary discipline, 15 undergraduate programs. 6 undergraduate programs were selected in the country's construction plan list of first-class undergraduate programs. About 8967 full-time undergraduate and graduate students enrolled in the faculty. They have made outstanding achievements in various international and domestic disciplinary competitions. Nearly 60% undergraduate students can 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 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 微纳电子学院 Micro-Nano Electronics	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 网络空间安全学院 Cyber 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
	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 & Instrument Science	生物医学工程 Biomedical Engineering
	测控技术与仪器** Measurement and Control Technology and Instrument**

*仅在竺可桢学院招生 *Enrolling in Chu Kochen Honors College 　　** 2019年取消招生 **Cancelled in 2019

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

人工智能 Artificial Intelligence

设计学 Design
设计艺术学 Art of Design

学生（人）Students

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	293	357	286	658	/	249	17	1860
	硕士生（全日制）Master	396	692	427	991	626	275	23	3430
	本科生（二、三、四年级）Undergraduate	377	982	544	1435	/	339	/	3677
招生数 Freshmen	博士生 Doctor	83	113	90	206	/	52	17	561
	硕士生（全日制）Master	132	234	140	333	371	88	23	1321
	本科生（一年级）Sophomore	95	256	154	550	/	61	/	1116
毕业生 Graduates	博士生 Doctor	44	35	37	51	/	30		197
	硕士生（全日制）Master	109	223	153	326	215	95	/	1121
	本科生 Undergraduate	113	287	122	428	/	121		1071
本科生深造与对外交流 Further Study and International Exchange of Undergraduate	毕业生* Graduate*	103	287	122	391		121	/	1024
	出国（境）深造率 Ratio of Further Studies Aboard	13.59%	13.6%	20.49%	18.16%	/	14.88%	/	16.31%
	国内读研率 Ratio of Further Studies at Home	39.80%	55.7%	47.54%	29.92%	/	36.36%	/	41.00%
	对外交流人次 International Exchange	192	524	147	703		124	/	1690

*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、队名/作品 Winners List	指导教师 Advisor
2020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）	亚军 First Runner-up	Phantom Ensemble：唐嘉辰 黎伟诺 李昌栋	王灿 Wang Can
	金牌 Gold Medal	Phantom Ensemble：唐嘉辰 黎伟诺 李昌栋	
		Solitary Dream：于倚岑 彭 博 褚写庭	
		CraZyMoon：陈天宇 张静圳 穆梓楠	
		Unknown：龙香遇 樊 睿 吕耀维	
		Refrain：卢旻昊 褚朱钇恒 冯 骁	
		Lingard：詹哲远 黄文翀 陈 逸	
		Subconscious：李彦奎 潘恩皓 陈思睿	
	银牌 Silver Medal	Guofuqian50：周屹赫 赵广泽 陈彦博	
		Gensokyo：刘静明 杨沛霖 章钧豪	
2020 IF设计奖 IF Design Award 2020	设计新秀奖 Design Talent Award	Bamboo Shoot：蒋凯琪 楼倩雅	/
		Green Guard：林 莹 郑涵佳	
DEFCON 2020 CTF	第一名 First Place	A*0*E战队：武翰杰 黄 山 吴宁超 马 麟 罗天翔 谢天晰 石攻玉	周亚金 Zhou Yajin
IDASH 安全基因计算大赛 IDASH Secure Genome Analysis Competition	Track II 第二名 Second Place	ZMCTeam：陈 元	周亚金 任 奎 Zhou Yajin Ren Kui

国内学科竞赛 Civil Disciplinary Competitions

竞赛名称 Competition	奖项 Award	获奖人员、队名/作品 Winners List	指导教师 Advisor
2020 RoboCup机器人世界杯中国赛 Robocup China Open	小型组冠军 First Place in Small Size League	ZJUNlict：黄哲远 郭达顺 张浩东 方献泽 李政希 陈先玮 王英建 黄 挺 李明昊 韩陈睿 王逸旦 杜浩哲 陈芷轲 葛 浩 张博群 彭德尚 张雯琳 沈 凝 王敬平 黄莳楠	熊 蓉 周春琳 Xiong Rong Zhou Chunlin
	类人组冠军 First Place in Humanoid League	ZJUDancer：靖 鑫 林焕彬 陈昕欣 戴 哲 沈晨涛 汪宇轩 刘睿杰 高一淳 许腾叶 焦笑然 叶佳木	
2020中国大学生程序设计竞赛 China Collegiate Programming Contest（CCPC）	季军 Second Runner Up	Phantom Ensemble：唐嘉辰 黎伟诺 李昌栋	王 灿 Wang Can
	金牌（10队次） Gold Medal	Phantom Ensemble：唐嘉辰 黎伟诺 李昌栋	
		Solitary Dream：于倚岑 彭 博 褚写庭	
		CraZyMoon：陈威志 张静圳 穆梓楠	
		Lingard：詹哲远 黄文翀 陈 逸	
		Refrain：卢旻昊 褚朱钇恒 冯 骁	
		Subconscious：吕耀维 潘恩皓 陈思睿	
		Guofuqian50：周屹赫 赵广泽 陈彦博	
	银牌 Silver Medal	Gensokyo：刘静明 杨沛霖 章钧豪	
		Unknown：龙香遇 凌子恒 樊 睿	
2020年第八届全国大学生光电设计竞赛 The 8th National University Students' Opt-Sci-Tech Competition	一等奖 First Place	面向机器人的微纳光纤仿生触觉传感器： 徐 琰 陶雨婷 刘 烨 傅小敏 潘 婧	张 磊 Zhang Lei
		基于3D内窥镜的增强现实手术训练导航系统：孙小凡 余方正 柏 凌 王晓雯 张华宁 金 涵	王立强 袁 波 Wang Liqiang Yuan Bo
		大智若昀——面向大尺寸显示的新型背光技术：蔡明轩 孙昊天 吴恩宗 方琳玥 丁章浩 刘映利	吴仍茂 Wu Rengmao
	二等奖 Second Place	快照式多功能医疗诊断仪：魏宇轩 贺 谐 潘 静 操蕲劼 王奕涵 黄 羿 张文屹	郝 翔 Hao Xiang
		基于双目视觉的坐姿智能识别与矫正系统：卢 益 谢 勇 葛维佳 黄科捷 黄冰佳 朱弘飞 何星勝	袁 波 王立强 Yuan Bo Wang Liqiang

国内学科竞赛 Civil Disciplinary Competitions（续）

竞赛名称 Competition	奖 项 Award	获奖人员、队名/作品 Winners List	指导教师 Advisor
2020全国研究生电子设计竞赛 2020 National Graduate Electronics Design Contest	二等奖 Second Place	新能源电池BMS技术：武钿登 汪庆文 陈民申	金心宇 Jin Xinyu
2020年全国大学生电子设计竞赛-模拟电路竞赛 2020 National Undergraduate Electronic Design Contest- Analog Circuit	二等奖 Second Place	高速放大电路设计：周 闯 杨向南 胡锦瑶	张 昱 李惠忠 Zhang Yu Li Huizhong
2020年全国大学生信息安全竞赛 2020 National College Student Information Security Contest	一等奖 First Place	来自东方的神秘力量：黄 山雷 骁 熊 皓	周亚金 Zhou Yajin
强网杯全国网络安全挑战赛 "QiangWang" National Cyber-security Competition	二等奖 Second Place	AAA：黄 山雷 骁 武翰杰 何豪杰 戴勤明 罗天翔 马 麟	周亚金 Zhou Yajin
X-NUCA全国高校网安联赛 X-NUCA National University Cyber-security Association	一等奖 First Place	AAA：黄 山雷 骁 何豪杰 戴勤明	周亚金 Zhou Yajin
2020中国高校计算机大赛—程序设计天梯赛 2020 China Collegiate Computing Contest(C4)-Group Programming Ladder Tournament	团队金奖 Gold Award	林思仪 龙香遇 陈思睿 付冰洋 王宣煊 张龙姣 潘恩皓 黎伟诺 陈 逸 杨沛霖 / 章钧豪 刘静明 卢旻昊 黄文翀 褚朱钇恒 冯 骁 凌子恒 王海纳 沈哲贝 樊 睿	王 灿 Wang Can
	个人一等奖 First Place	刘明锐 唐嘉辰 潘恩皓 陈思睿 赵广泽 陈彦博 彭 博 龙香遇 褚朱钇恒 吕耀维	/
2020中国高校计算机大赛—移动应用创新赛 2020 China Collegiate Computing Contest(C4)-Mobile Application Innovation Competition	一等奖 First Place	Seal Create：伍文棋 吴润凡 沈心逸	张克俊 Zhang Kejun
2020中国高校计算机大赛—网络技术挑战赛 2020 China Collegiate Computing Contest(C4)-Network Technology Challenge Finals	一等奖 First Place	Wavesdropper：王 超 刘子威 沈轶杰 杨博麟 宣博瀚	林 峰 张 帆 Lin Feng Zhang Fan
	二等奖 Second Place	自然选择前进四：沈乐明 刘宇一 白凤杨	韩劲松 Han Jingsong
		Emnets：周寒 范宏昌 曾思钰	董 玮 高 艺 Dong Wei Gao Yi

国内学科竞赛 Civil Disciplinary Competitions（续）

竞赛名称 Competition	奖 项 Award	获奖人员、队名/作品 Winners List	指导教师 Advisor
2020中国高校计算机大赛—微信小程序应用开发赛 2020 China Collegiate Computing Contest (C4)-WeChat Program Development Competition	小游戏赛道 二等奖 Second Place	Greeners：王舒弘 马学明 俞佳兴 夏宇航	张克俊 Zhang Kejun
	二等奖 Second Place	AE86：方 正 陈雨航	
		Serendipity装机：刘建华	
"华为杯"第二届中国研究生人工智能创新大赛 China Graduate AI Innovation Competition	一等奖 First Place	SMAP：方 琦 田雨晴 吕 �	/
		Producer•AI：陈欣宜 吴宋若瑶 李 豫 张 卉	张克俊 Zhang Kejun
		十七张牌你能秒我：任金伟 朱建波 曾 强 顾煜镠	朱建科 Zhu Jianke
		CPS Team：舒浩然 王宇威 韩 强 徐博文	王 智 Wang Zhi
	二等奖 Second Place	CURD：尹航 姚强 施杰根 任昊	侯迪波 Hou Dibo
		Sod_One：赵子鸣 李婷婷 李兆轩 李文灏	张 帆 Zhang Fan

专项奖 Special Awards

奖 项 Award	获奖学生 Winners	学 院 College of
2019-2020学年浙江大学竺可桢奖学金 Chu Kochen Scholarship	韩佳晓 Han Jiaxiao	光电学院 Optical Science and Engineering
	齐 俏 Qi Qiao	信电学院 Information Science and Electronic Engineering
	傅婧芸 Fu Jingyun	信电学院 Information Science and Electronic Engineering
	林皓泓 Lin Haohong	控制学院（竺可桢学院） Control Science and Engineering Chu Kochen Honors College
	刘书含 Liu Shuhan	计算机学院 Computer Science and Technology

海外交流
International Exchange and Cooperation

学部2020年教师出访参加学术会议、合作交流共133人次，约接待110人次国外学者来访进行学术交流（含在线），主办国际会议5次。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，进一步提升了科研与教学水平。

In 2020, 133 persons visited abroad for academic exchange and cooperation. About 110 world-renowned scholars (including online) were invited to visit FIT. Meanwhile, we successfully hosted about 5 international conferences. 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	第11届IEEE传感器阵列和多通道信号处理国际研讨会（线上） The 11th IEEE Sensor Array and Multichannel Signal Processing Workshop	6月8日-6月11日 Jun 8-11
2	2020 电气和电子工程师协会/计算机协会国际服务质量学术研讨会（在线） IEEE/ACM International Symposium on Quality of Service Conference (IEEE/ACM IWQoS 2020)	6月15日-6月17日 Jun 15-17
3	2020网络空间安全西湖在线论坛 The 4th Westlake International Online Forum on Cyber Security Research	11月26日-11月27日 Nov 26-27
4	第五届西湖国际光电子研讨会 The 5th West-Lake Photonics Symposium	11月28日 Nov 28
5	IEEE MTT-S 国际计算电磁和多物理建模与优化国际会议（线上线下结合） 2020 IEEE MTT-S International Conference on Numerical Electromagnetic and Multiphysics Modeling and Optimization（IEEE MTT-S NEMO 2020）	12月7日-12月9日 Dec 7-9

2020 IEEE MTT-S NEMO Conference,Dec. 7-9,Hangzhou, CHINA

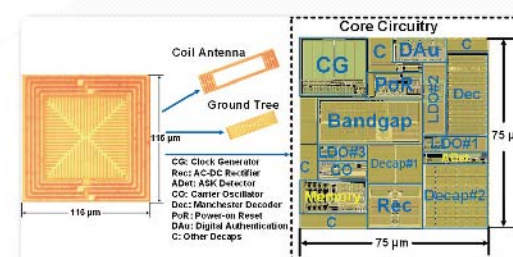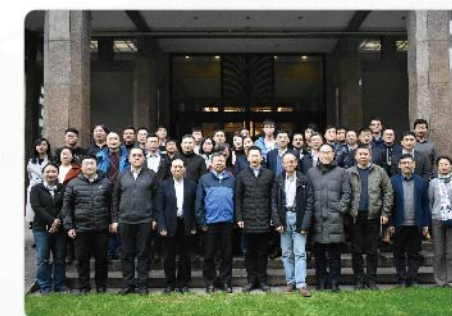# 2020要闻
News 2020

1月9日，"面向5G应用的车联网基础理论与关键技术"国家自然科学基金重点项目群年度学术研讨会在杭州召开

On Jan. 9th, Annual Academic Symposium of National Natural Science Foundation Key Project Group named "Basic Theory and Key Technologies of Internet of Vehicles for 5G Application" was held in Hangzhou.


2月23日，信电学院百人计划研究员赵博于JSSC上发布世界上最小的无线通信芯片

On Feb. 23rd, the world's smallest wireless communication chip was published on JSSC by Zhao Bo, ZJU 100 Young Professor from ISEE.

3月20日，光电刘旭教授和信电陈红胜教授领衔项目均入选2019中国光学十大学术进展

On Mar. 20th, the projects led by Prof. Liu Xu from COSE and Prof. Chen Hongsheng from ISEE were selected as the 2019 Top 10 Academic Progress of China Optics.
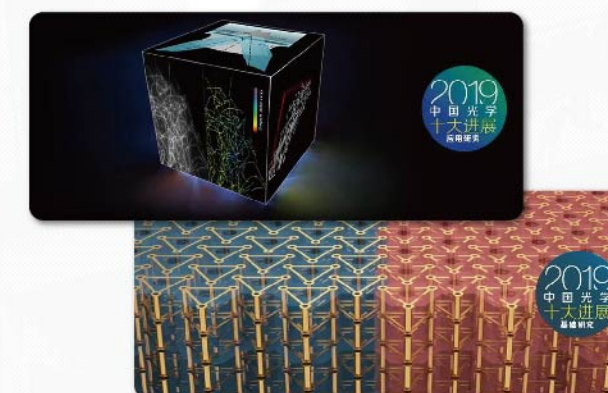
4月9日，中国工程院吴汉明院士全职加盟浙大微纳电子学院

On April 9th, Wu Hanming, academician of Chinese Academy of Engineering, joined College of Micor-Nano Electronics, ZJU.

5月11日，信息学部共4项学术研究成果入选浙江大学2019年度十大学术进展（含提名）

On May 11th, 4 academic research achievements from FIT were selected as the 2019 Top 10 Academic Progress of ZJU (including nominations).

8月27日，信电学院博士研究生马涵之获IEEE电磁兼容协会主席纪念奖（研究生国际最高奖）

On Aug. 27th, Ma Hanzhi, Ph. D. student from ISEE, was awarded IEEE EMC Society President's Memorial Award (the highest international award for graduate students).

5月21日，网安学院任奎团队人工智能助力生物识别精准化进展刊文于光明日报2020年5月21日第16版

On May 21st, the research work on artificial intelligence applied in biometric precision progress, which was directed by Prof. Ren Kui from Network Security College , was published in the 16th edition of Guangming Daily of China 2020.

9月1日，信息领域科学家成功研制出全球神经元规模最大的类脑计算机

On Sept. 1st, scientists from information field developed the world's largest brain-like computer with neurons.

7月3日，信息学部FIT论坛（第4期）举办浙江大学-阿里巴巴物联网技术研讨会

On July 3rd, the 4th FIT Forum was held on the theme of Internet of Things Technology between ZJU and Alibaba.

9月3日，信息学部3位老师（信电学院史治国、计算机学院陈文智、彭列平）荣获浙江大学2020年永平教学贡献（含提名）奖教金

On Sept. 3rd, three teachers from FIT (Shi Zhiguo from ISEE, Chen Wenzhi and Peng Liping from CCST) were awarded the 2020 Yongping Teaching Contribution Award (including nominations) in ZJU.

8月8日，信息学部主任陈纯院士出任宁波城市大脑首席科学家

On Aug. 8th, Academician Chen Chun, dean of the FIT, was appointed as chief scientist of Ningbo Urban Brain.

AnnualReport
2020

2020 年报

9月28日，光电学院刘东刘崇团队成功研制国内首台海洋高光谱分辨率激光雷达

On Sept. 28th, Liu Dong and Liu Chong from COSE successfully developed the first marine hyperspectral resolution lidar in China.

10月27日，信电学院李尔平教授受聘中国电磁环境效应产业技术创新战略联盟副理事长

On Oct. 27th, Prof. Li Erping from ISEE was appointed as Vice President of China Electromagnetic Environmental Effects Industrial Technology Innovation Strategic Alliance

11月9日，控制学院许超、高飞团队自主无人机集群最新研究成果登上Science首页新闻

On Nov. 9th, the latest research achievements of autonomous UAV cluster by Xu Chao and Gao Fei from CSE were published on the first page of Science.

12月2日，计算机学院教授卜佳俊入选"2020年度中国残疾人事业新闻人物与助残新闻人物"

On Dec. 2nd, Prof. Bu Jiajun from CCST was selected as the 2020 Annual Newsmaker of Helping the Disabled.

12月4日，信息学部召开FIT论坛第5期---听陈纯院士讲那过去的科研趣事。同日进行的还有学部个推青年创新奖2019年度颁奖典礼和2020年度评审会。

On Dec. 4th, the 5th FIT Forum on Interesting Research Story shared by Academician Chen Chun, dean of FIT, was conducted. Meanwhile, the Ceremony of 2019 and the Selection of 2020 for Youth Innovation Award was held.

生仪学院研究员吴丹入选达沃斯论坛2020年度青年科学家榜单

Wu Dan, a researcher from BME, was selected as one of the 2020 Young Scientists at World Economic Forum.

光电学院赵保丹研究员成为2020年阿里巴巴达摩院青橙奖唯一一名女科学家，并入选2020年福布斯中国30岁以下精英榜

Zhao Baodan, a researcher from COSE, was awarded scientist in 2020 Alibaba Damo Academy Green Orange Award, and was selected in the 2020 Forbes China 30 Under 30.
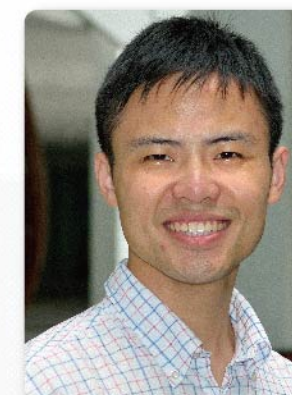
计算机学院鲍虎军教授荣获第三届"最美浙江人·最美科技人"

Prof. Bao Hujun from CCTS was awarded the most beautiful scientific and technological person in Zhejiang Province

控制学院熊蓉教授荣获"中国工业应用移动机器人行业贡献人物奖"

Prof. Xiong Rong from CSE was awarded the Industry Contribution Award of China Industrial Application Mobile Robot.

控制学院程鹏获教育部高等学校科学研究优秀成果奖青年科学奖

Prof. Cheng Peng from CSE won the Youth Science Award of Excellent Scientific Research Achievement Award in Higher Education of the MOE

33 Faculty of Information Technology Zhejiang University

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