



西北工业大学  
NORTHWESTERN POLYTECHNICAL UNIVERSITY

# 2024人工智能基础大会

2024 Conference on Foundations of Artificial Intelligence  
(CFAI)

2024年9月28-29日

中国·西安

## • 会议议程 •

**主办单位：**西北工业大学

**协办单位：**中国系统工程学会网络空间安全与治理专委会(筹)

中国人工智能学会人工智能基础专委会

先进技术成果长三角转化中心

**赞助单位：**绿盟科技集团股份有限公司





# 目录

## Contents

- 1 会议介绍 | Conference Introduction .....02
- 2 会议指南 | Conference Guide .....03
- 3 会议议程 | Conference Agenda .....04
- 4 嘉宾介绍 | Guest Introduction .....06
- 5 组织架构 | Organizing Committee .....23

1

会议介绍

Conference Introduction

2024 人工智能基础大会将于 2024 年 9 月 28 日至 29 日在西安举办。活动由西北工业大学主办，中国系统工程学会网络空间安全与治理专委会（筹）、中国人工智能学会人工智能基础专委会、先进技术成果长三角转化中心协办。

本次大会邀请国内外院士、知名专家学者做精彩报告，将分两个专题探讨人工智能基础领域最新的研究成果、前沿思维和创新技术。从学术交流、科研合作、产学研转化等各方面总结、讨论国内外所取得的工作进展，持续推动人工智基础能领域的学术研究、技术突破、人才培养和成果落地。

- 主办单位：西北工业大学
- 协办单位：中国系统工程学会网络空间安全与治理专委会（筹）  
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先进技术成果长三角转化中心
- 赞助单位：绿盟科技集团股份有限公司

2

会议指南

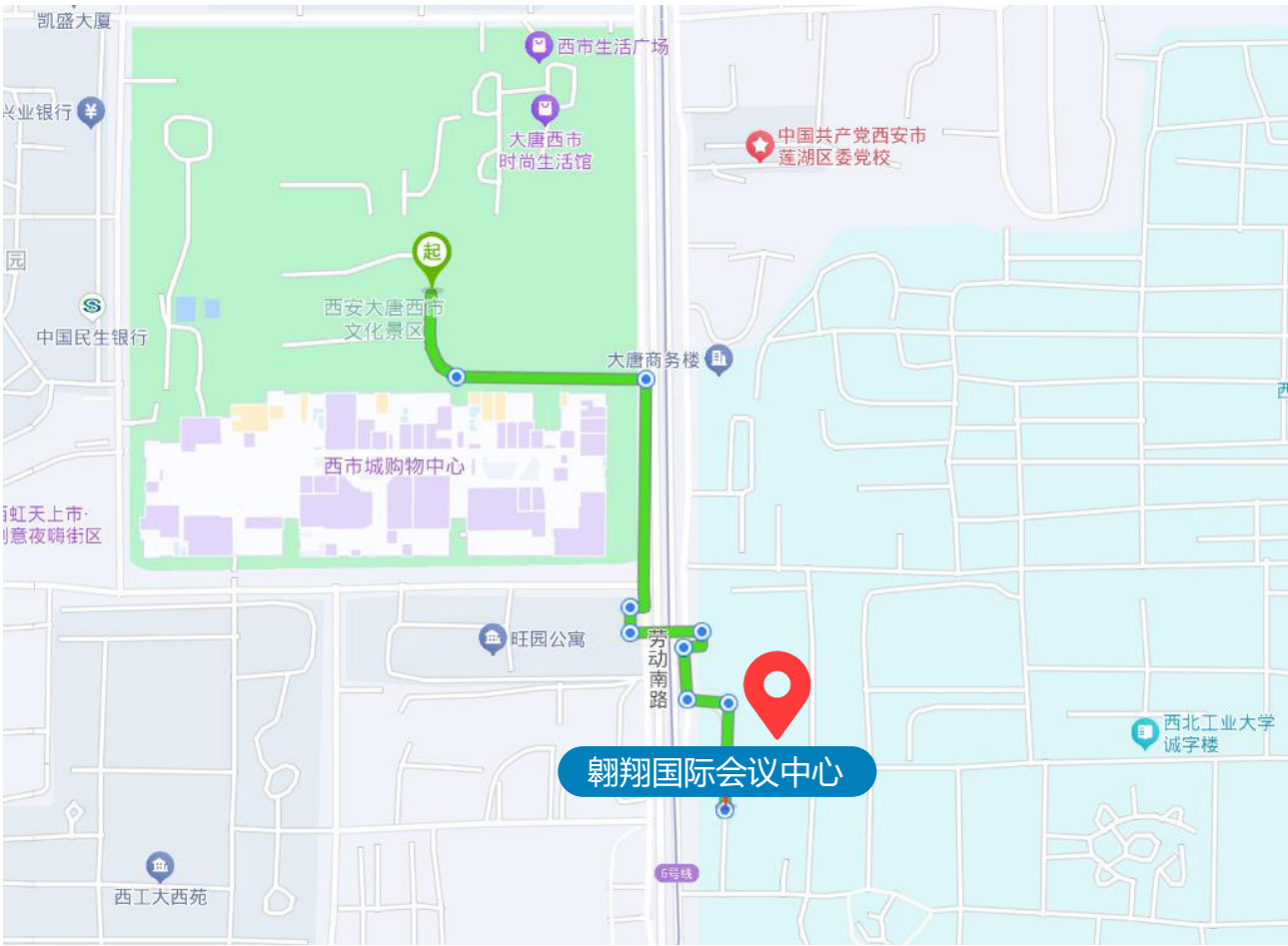
Conference Guide

欢迎参加 “2024 人工智能基础大会”

2024 Conference on Foundations of Artificial Intelligence (CFAI)

会议时间：2024 年 9 月 28 日至 29 日

会议地点：西北工业大学翱翔国际会议中心（陕西省西安市碑林区劳动南路 17-3 号）





3 会议议程Meeting Agenda

2024 年 09 月 28 日 ( 星期六 )

时间	内容	地点
8:20~8:25	大会致辞 致辞人：李昂生	翱翔国际 会议中心 五楼 翱翔厅
8:25~09:45	大会报告 主持人：李昂生	
	陈恩红（中国科学技术大学） 推荐大模型的进展与实践	
	熊 辉（香港科技大学（广州）） Human and Social Nature in AI Algorithms	
09:45~09:50	合影	
09:50~10:00	茶歇	翱翔国际 会议中心 五楼 翱翔厅
10:00~12:00	大会报告 主持人：于登秀	
	黄廷文（深圳理工大学） 浅谈人工智能与几个优化问题的算法 Ioannis Liritzis（European Academy of Sciences & Arts） Can We Speak of AI in Archaeology? 贺喆南（四川大学） 鲁棒优化的进化计算方法	
12:00~14:00	午餐	翱翔国际会 议中心二楼
14:00~16:00	大会报告 主持人：孙文	翱翔国际 会议中心 五楼 翱翔厅
	张晓明（香港浸会大学） Deep Long-tailed Data Learning towards Visual Recognition 兰旭光（西安交通大学） 世界模型构建与因果推理 Petia Radeva（University of Barcelona, Spain） Data-Centric Food Computing	
16:00~16:20	茶歇	
16:20~17:40	大会报告 主持人：朱培灿	
	Umapada Pal（Indian Statistical Institute, India） Can Computer Help Teachers in Grading of Examination Paper? 刘生钟（上海交通大学） On Exploring Robust Foundation Models for Multi-Modal IoT Signals	
18:00~20:00	晚宴	翱翔国际会议中心 五楼聚雅厅

2024 年 09 月 29 日 ( 星期日 )

时间	内容	地点
08:30~10:30	大会报告 主持人：高超	翱翔国际 会议中心 五楼 翱翔厅
	张文生（中科院自动化所） Tensor Multi-Elastic Kernel Self-Paced Learning for Time Series Clustering 叶晓虎（绿盟科技 CTO） 大模型赋能网络安全运营和对抗应用进展和问题 段海滨（北京航空航天大学） UAV Swarm Inspired by Bird Flock Intelligence Incentive and Convergence	
10:30~10:40	茶歇	
10:40~12:40	大会报告 主持人：杨肖	
	程 龙（中科院自动化所） Intelligent Human-Machine Interaction for Wearable Robots 程 徐（天津理工大学） Ship Motion Data-Driven Sea State Estimation for Autonomous Ships Massimo Tistarelli（University of Sassari, Italy） Human Face Recognition: Learning from Biological Deep Networks	
12:40~14:00	午餐	翱翔国际会 议中心二楼



# 4 嘉宾介绍

## Guest Introduction

### 大会报告嘉宾 (9月28日上午)



**个人简介:** 陈恩红, 中国科学技术大学讲席教授, 博士生导师, 认知智能全国重点实验室副主任, IEEE Fellow, CAAI 会士, CCF 会士, 中国人工智能学会机器学习专委会副主任, 安徽省计算机学会理事长, 大数据分析与应用安徽省重点实验室主任, 国家级创新领军人才计划, 国家杰出青年基金获得者, 主持并承担了国家重点研发计划项目、国家自然科学基金重大仪器研制项目、国家自然科学基金杰出青年基金项目、国家自然科学基金区域联合重点项目等重大研究项目。陈恩红教授主要聚焦于情境数据挖掘等领域, 相关研究成果发表 CCF A 类论文近 200 篇, 谷歌引用 29800 余次, H 指数 87, 获教育部高等学校自然科学一等奖、吴文俊科技进步一等奖、CCF 科技成果奖自然科学一等奖, 以及 KDD、ICDM 等顶级会议最佳论文 / 学生论文、2024 APWeb-WAIM Test of Time Award 等奖项。

#### 报告题目: 推荐大模型的进展与实践

**报告摘要:** 大模型已经成为推荐系统的创新技术, 它们通过处理海量数据, 能够精准地捕捉和预测用户的兴趣偏好, 为用户提供个性化的推荐服务。最新的研究工作表明, 与传统推荐算法相比, 基于大模型的推荐系统在性能上实现了质的飞跃。然而, 推荐大模型的有效性并非没有挑战, 例如大模型的训练需要依赖于高质量的数据及特定的架构设计, 数据的质量和架构设计直接影响到模型的学习和预测能力。本报告将简要介绍推荐大模型的背景, 并梳理当前不同类别推荐大模型架构及思路, 并围绕序列推荐中的与数据生成及选择、用户多行为分析、推荐大模型架构及幂律定律等方面开展介绍, 并分享实际落地经验与发现。



**个人简介:** Dr. Xiong Hui holds esteemed positions at the Hong Kong University of Science and Technology (Guangzhou) as a **Chair Professor, Associate Vice-President for Knowledge Transfer, and the Founding Head of the Artificial Intelligence Thrust**. Dr. Xiong received his Ph.D. in Computer Science from the University of Minnesota-Twin Cities, USA. His research interests include data science and artificial intelligence, and he has published over 400 papers in his field. His Google Citation amounts to over 42,000, with an h-index of 92. He currently serves as the ACM SIGKDD Secretary,

the Co-Editor-in-Chief of Encyclopedia of GIS, the Deputy Director of the CCF Expert Committee on Big Data, and the Editor-in-Chief of npj | Artificial Intelligence. He has served regularly on the organization and program committees of numerous conferences, including as a Program Co-Chair of the Industrial and Government Track for the 18th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD), a Program Co-Chair for the IEEE 2013 International Conference on Data Mining (ICDM), a General Co-Chair for the 2015 IEEE International Conference on Data Mining (ICDM), and a Program Co-Chair of the Research Track for the 2018 ACM SIGKDD International Conference on Knowledge Discovery and Data Mining. He previously served as Chief Scientist (Smart City) and Deputy Dean of Baidu Research Institute, leading five research labs. Prof. Xiong has received numerous honors and awards for his outstanding academic contributions, such as the 2021 AAAI Best Paper Award, the 2017 IEEE ICDM Outstanding Service Award, and the 2011 IEEE ICDM Best Research Paper Award. For his outstanding contributions to data mining and mobile computing, he was elected as a Fellow of the American Association for the Advancement of Science (AAAS), Distinguished Scientist of the Association for Computing Machinery (ACM), and Fellow of the Institute of Electrical and Electronics Engineers (IEEE).

#### 报告题目: Human and Social Nature in AI Algorithms 人工智能算法中的人性和社会性

**报告摘要:** Algorithms have been inspired by nature and human life and have been a part of human technology ever since the stone stage. As the computers have been widely used for solving everyday human problems, algorithms are fast-evolving and it becomes naturally to think algorithmically about the human and nature world. In this talk, I would like to provide a humble and immature view of human and social nature in algorithms. In particular, I would like to bridge the connections between the fundamental principle and properties of these algorithms and the nature in Chinese culture, such as I-Ching and Daoism, which conceive the natural world as a self-generating, complex arrangement of elements continuously changing and interacting. For example, the balance principle in I-Ching is frequently observed in algorithm design, such as the explore/exploit tradeoff for finding the balance between trying new things and enjoying the favorites and the balance between recall and precision.



**个人简介:** Tingwen Huang is a Chair Professor at Shenzhen University of Advanced Technology. He received his B.S. degree from Southwest Normal University (now Southwest University), China, 1990, his M.S. degree from Sichuan University, China, 1993, and his Ph.D. degree from Texas A&M University, College Station, Texas, 2002. After graduated from Texas A&M University, he worked as a Visiting Assistant Professor there. Then he joined Texas A&M University at Qatar (TAMUQ) as an Assistant Professor in August 2003, then he was promoted to Professor in 2013. Dr.

Huang's research areas include neural networks, chaotic dynamical systems, complex networks, optimization and control, smart grid. He is a Fellow of IEEE and IAPR (International Association for Pattern Recognition). He is a Member of European Academy of Sciences and Arts, and a Fellow of The World Academy of Sciences (发展中国家科学院).

**报告题目: Brief Introduction to AI and Several Algorithms for Optimization Problems**

**报告摘要:** A brief introduction to the development of artificial intelligence includes the 2012 deep neural network winning the ImageNet image recognition competition, and the 2016 AlphaGO victory over the Go world champion, ChatGPT. Algorithms plays a critical role in artificial intelligence. Then, two algorithms for optimization problems are introduced. One is to find the optimal solution of the energy trading problem of microgrid based on reinforcement learning algorithm. No information about the distribution of proceeds is available a priori, and the strategy chosen by each microgrid is private to the adversary. To address this challenge, a repetitive game-based new energy trading framework enables each microgrid to individually randomly select a strategy to maximize his/her average income. The other is an optimization algorithm based on distributed asynchronous broadcasting, which solves the distributed convex optimization problem on unbalanced directed multi-agent (without central coordinator) networks with inequality constraints. Not only does the algorithm allow agent updates to be asynchronous in a distributed manner, but the step sizes of all agents are uncoordinated. An important feature of the proposed algorithm is that it deals with constraint optimization problems in the case of unbalanced directed networks, the communication of which may be affected by possible link failures.



**个人简介:** Ioannis Liritzis, with a PhD in Physics from Edinburgh University and recipient of the University's Scholarship, interviewed by Nobel Prize Winner Peter Higgs; currently, he is a distinguished professor of archaeometry and interdisciplinary approaches to archaeology, cultural heritage, and paleoenvironment at Henan University, China; and Professor at AMEU University, Slovenia. Dean of Class IV (Natural Sciences) at the European Academy of Sciences & Arts (Salzburg). Formerly full professor & Director (& Founder) of Laboratory of Archaeometry, Dept. of Mediterranean Studies at the

University of the Aegean (1999-2021). Initiator and Director-Coordinator of the Kastrouli Mycenaean Settlement archaeological-archaeometrical Project; Member of the European Academy of Sciences & Arts; Corresponding Member of the Academie des Sciences, Arts & Belles Lettres, Dijon, France; Honorary & Guest Professor of Samara State Institute of Culture, Russia; Honorary Fellow Edinburgh University, Honorary Professor Rhodes University, South Africa; International Partner Center for Cyber Archaeology & Sustainability at University of California San Diego. His prior career includes the Greek Ministry of Culture, Dept of Underwater Antiquities (1984-1989), and the Academy of Athens, Research Center for Astronomy & Applied Mathematics (1989-1999). He is the initiator of the European Delphic Intellectual Movement in the European Academy of Sciences & Arts (Austria).

**报告题目: Can we speak of AI in Archaeology?**

**报告摘要:** Is it rather premature to use of the term "artificial intelligence" (AI) in archaeology? Noting that while machine learning and neural networks are used for tasks like classification, and simulations may consider AI, the term may be overused. Algorithmic operations and neural networks have already been used for many years. They do not include in the process the essential concept of "intelligence" that is characteristic of the human dimension.

However, I argue that the term "AI" is still valuable as it highlights the delegation of human expertise to machines.

Highlights will be presented on AI applications in language (decipher ancient languages, preservation (AI for preserving & restoring artifacts), analyze artifacts, archaeological settlements (locating new excavation sites), protection (securing and protecting sensitive archeological sites).





**个人简介：**贺喆南，四川大学教授，博士生导师，发展规划处副处长。全国学位与研究生教育学会工程专业学位工作委员会委员。于 2008 年在北京科技大学获得学士学位，2014 年在美国俄克拉荷马州立大学获博士学位。主要从事智能学习和优化理论、算法、及应用体系研究。以第一或通讯作者在信息科学国际一流期刊和会议发表论文 30 余篇。主持 10 余项科研项目，包括国家自然科学基金、国家重点研发计划项目子课题、军委科技委项目、四川省重点研发项目、以及中石油和中核集团等国家支柱企业基金项目。

#### 报告题目：鲁棒优化的进化计算方法

**报告摘要：**不确定性扰动下的鲁棒优化是智能优化的重要研究方向。

本报告深入剖析鲁棒优化问题特性，研究进化计算理论方法，聚焦于鲁棒优化的进化计算理论方法及应用。首先，针对变量扰动导致的多目标优化鲁棒性问题，建立不确定性对多目标优化的扰动度量机制，提出了不确定性扰动下的变量域修复进化方法；以进化之后的变量域，保证变量扰动下的多目标优化鲁棒性，形成个体“解”自修复、种群“解”自组织能力。第二，针对函数扰动导致的多目标优化鲁棒性问题，挖掘若干典型场景的多目标优化“解”分布特征，针对每一个典型场景，确定相应的鲁棒变量域；提出了不确定性扰动下的变量域聚合进化方法，以若干鲁棒变量域的公共区域，作为进化之后的变量域，保证函数扰动下的多目标优化鲁棒性。最后，针对鲁棒性评估的大规模显式采样受限于计算资源等问题，提出了隐式采样方法，在进化求解过程中，以邻域范围内的生成“解”，作为隐式采样点，当生成规模足够大时，则无需采样。

## 大会报告嘉宾 (9月28日下午)



**个人简介：**张晓明 (CHEUNG, Yiu-ming) 为香港浸会大学 (浸大) 人工智能讲席教授及香港研资局高级研究学者，同时担任浸大深圳研究院院长以及计算和理论科学研究所副所长，是 IEEE Fellow、AAAS Fellow、IET Fellow、英国计算机学会 Fellow 以及教育部长江学者 (讲座教授)，于 2020 年获选为 IEEE 计算智能学会杰出讲师。他被列入 2019 至 2023 年斯坦福大学所发表的人工智能与图像处理专业领域世界顶尖科学家排名前 1%。张教授现为 IEEE Transactions on Emerging Topics in Computational Intelligence 期刊主编。此外，他也是 IEEE 计算智能学会香港分会始创者及前任主席，曾于 2018-2022 年担任 IEEE 计算机学会智能信息学委员会 (TCII) 主席。张晓明教授长期从事机器学习与视觉计算以及其在数据科学、模

式识别、多目标优化及信息安全等应用领域的研究，在相关国际著名期刊及学术会议上，如 IEEE Transactions on Pattern Analysis and Machine Intelligence、IEEE Transactions on Information Forensics and Security、IEEE Transactions on Image Processing、IEEE Transactions on Knowledge and Data Engineering、IEEE Transactions on Neural Networks、IEEE Transactions on Circuits and Systems for Video Technology、CVPR、IJCAI、AAAI、MM 等已发表论文逾 300 篇，其中四篇合著论文被选为《ESI 高被引论文》（即在相应学科中全球排名前 1%）。张教授曾获得多个学术奖项，包括 2023 年亚太神经网络学会杰出成就奖、2023-2024 年度学术工作杰出表现校长奖、2024 年浸大创新奖、WI-IAT2020 最佳理论论文奖以及多次荣获国际会议最佳论文奖等。他已负责主持及承担包括香港研究资助局 (RGC)、国家自然科学基金 (NSFC) 以及 NSFC-RGC 联合基金等科研项目三十余项。张教授作为第一发明人现拥有三项发明专利。曾于 2017 年在瑞士日内瓦举行的第 45 届日内瓦国际发明展上（该发明展吸引了超过 700 个来自 40 个国家的参展商，合共展出超过 1000 件创新发明及产品）荣获计算机科学组别优异金奖（即金奖中的最高级别）及瑞士汽车会大奖二项国际大奖，并获 2017 年第七届香港创新科技成就大奖香港创新发明奖金牌。此外，于 2018 年再次荣获第 46 届日内瓦国际发明展评判嘉许特别金奖（即金奖中的最高级别）以及罗马尼亚优异奖。他曾担任包括 IJCAI、ACML、ICIP、ICPR、ICDM 以及 WI 在内的多个国际著名会议的程序委员会主席、组织委员会主席、领域主席等。张教授是 IEEE 智能计算学会以及计算机学会的 Fellow 评审委员会评委、香港研究资助局优配研究金工程学科评委，以及国家基金委、深圳科创委项目评审专家。他担任若干国际著名期刊的副主编，如：IEEE Transactions on Neural Networks and Learning Systems (2014-2020) IEEE Transactions on Cybernetics、IEEE Transactions on Emerging Topics in Computational Intelligence、IEEE Transactions on Cognitive and Developmental Systems、Pattern Recognition 以及 Neurocomputing 等。

#### 报告题目：Deep Long-tailed Data Learning towards Visual Recognition

**报告摘要：**Although deep learning has made great progress, a good model often requires a large amount of artificially balanced and annotated data. Unfortunately, real-world data are often unbalanced, typically exhibiting a long-tailed distribution, which refers to a small number of classes with abundant training samples but the remaining large number of classes only with very few training instances. Under the circumstances, the performance of deep learning models trained on long-tailed data declines sharply in the tail classes. However, tail classes cannot be ignored in various situations such as rare disease diagnosis, and anomaly detection. Subsequently, long-tailed data is still very challenging to deep learning. In this talk, the impact of long-tailed data on deep learning models will be first introduced. Then, the research progress in this area will be reviewed, including some representative methods in the literature. Lastly, the potential research directions in this field will be discussed.





**个人简介:** 兰旭光, 教授, 博士生导师, 国家杰出青年科学基金获得者, 国务院学位委员会学科评议组成员。现任西安交通大学人工智能学院教授, 研究领域为计算机视觉、机器人学习、多智能体博弈及人机共融协作等。担任中国自动化学会共融机器人专委会主任委员, 中国认知科学学会理事、副秘书长, 人工智能学会“认知系统与信息处理”专委会副主任委员, 仿真学会“智能无人系统建模仿真”专委会副主任委员。在人工智能与机器人领域的著名期刊和会议上如 IEEE Trans 和 ICML/CVPR/RSS 等发表论文 100 余篇, 获得国家发明专利授权 20 余项, 出版编著 1 部。主持国家自然科学基金重点、国家科技重大专项、科技创新 2030 人工智能重大项目等科研项目 10 余项, 相关研

究成果已应用于航天、航空等领域。担任国际期刊 IEEE Transactions on Neural Network Learning System 等期刊的编委。曾担任 IEEE CYBER2019 和 ICIRA2021 大会联合程序主席, IEEE RCAR2023 和 ICIRA2024 大会主席, IEEE 高级会员。

#### 报告题目: 世界模型构建与因果推理

**报告摘要:** 报告简要介绍物理世界具身智能的挑战, 提出了非结构场景基于常识和视觉推理的机器人自主作业方法, 将语言大模型融入机器人交互, 使得机器人能够在动态非结构场景进行视觉推理, 完成自主作业。报告还介绍了具身智能的持续强化学习、决策大模型想象引导的多机器人自主协同方法, 以及相关算法在物流、航空等领域的应用。



**个人简介:** Prof. Petia Radeva is a Full professor at the Universitat de Barcelona (UB), Head of the Consolidated Research Group “Artificial Intelligence and Biomedical Applications (AIBA)” at the University of Barcelona. Her main interests are in Machine/Deep learning and Computer Vision and their applications to health. Specific topics of interest: data-centric deep learning, uncertainty modeling, self-supervised learning, continual learning, learning with noisy labeling, multi-modal learning, NeRF, food recognition, food ontology, etc.

She is Main editor in Chief of Pattern Recognition journal (Q1,

IP=8.0). She is a Research Manager of the State Agency of Research (Agencia Estatal de Investigación, AEI) of the Ministry of Science and Innovation of Spain.

Petia Radeva belongs to the top 2% of the World ranking of scientists with the major impact in the field of TIC according to the citations indicators of the popular ranking of Stanford. Also, she was selected in the first 6% of the ranking of Spanish and foreign most cited female researchers from any field according to the Ranking of CSIC: <https://lnkd.in/d/jx2Yz5p>. Moreover, she was awarded the prestigious “Narcis Monturiol” medal in 2024, IAPR Fellow since 2015, ICREA Academia’ 2015 and ICREA Academia’ 2022 assigned to the 30 best scientists in Catalonia for her scientific merits, received several international and national awards ( “Aurora Pons Porrata” of CIARP, Prize “Antonio Caparrós” for the best technology transfer at UB, etc).

She supervised 24 PhD students and published more than 100 SCI journal publications and in total, >400 international chapters and proceedings, her Google scholar h-index is 54 with >11900 cites.

#### 报告题目: Data-centric Food computing

**报告摘要:** Deep Learning (DL) has made remarkable progress, achieving super-human performance. However, when it comes to classifying a complex domain as food recognition, there is still much room for improvement. Additionally, DL relies on greedy methods that require thousands of annotated images, which can be a time-consuming and tedious process.

To address these issues, we will discuss several data-centric approaches that help to the problem, specially how self-supervised learning offers an efficient way to leverage a large amount of non-annotated images and to make DL models more robust and accurate. Moreover, we will present how a new combination of self-supervised, and prompt learning can help to the fine-grained food recognition.



**个人简介:** Umapada Pal received his PhD from Indian Statistical Institute in 1997 and he did his Post Doctoral research at INRIA, France. From January 1997, he is a faculty member of Computer Vision and Pattern Recognition Unit of the Indian Statistical Institute, Kolkata. He was the former Head and at present he is a Professor (in HAG Scale) of the Computer Vision and Pattern Recognition Unit. He is also an Adjunct Professor of University of Technology Sydney, Australia. His fields of research interest are towards different pattern recognition and computer vision problems like Digital document

analysis, Camera/video text processing, Biometrics, Image retrieval, Keyword spotting, Video analysis, Medical image analysis, Pose estimation, Image/video generation etc. He has published more than 535+ research papers in various international journals, conference proceedings and edited volumes. Because of his significant impact in the Document Analysis research, in 2003 he received "ICDAR Outstanding Young Researcher Award" from International Association for Pattern Recognition (IAPR). In 2005-2006, Dr. Pal has received JSPS fellowship from Japan government. Dr. Pal has been serving as General/Program/Organizing Chair of many conferences including International Conference on Document Analysis and Recognition (ICDAR), International Conference on Frontiers of Handwritten Recognition (ICFHR), International Workshop on Document Analysis and Systems (DAS), Asian Conference on Pattern recognition (ACPR) etc. International Conference on Pattern recognition (ICPR) will be in first time in India in 2024 under his leadership. Also, he has served as a program committee member of more than 60 international events. He has supervised 17 PhD students. He has many international research collaborations and currently supervising Ph.D. students of 5 foreign universities. Also, he has visited more than 30 countries for his academic work. He is the In-Charge of the joint research cluster of the Indian Statistical Institute and the University of Technology Sydney, Australia. He is the founding Co-Editor-In-Chief of Springer Nature Computer Science journal. He is serving as Associate Editor of many journals like Pattern Recognition, ACM Transactions of Asian Language Information Processing, Pattern Recognition Letters (PRL), International Journal of Document Analysis and Recognition, IJPRAI, and IET Biometrics. Also, he has served as a guest editor of several special issues. He is a Fellow of International Association for Pattern Recognition (IAPR), Fellow of the Asia-Pacific Artificial Intelligence Association (AAIA), Fellow of the International Artificial Intelligence Industry Alliance (AIIA), Fellow of Indian National Academy of Engineering (INAE), Fellow of West Bengal Academy of Science and Technology (WAST) etc. He is the IAPR fellow selection committee Chair for 2022-2024. Also, he is among the top 2% scientists in the world from 2020 as listed by the Stanford University.

### 报告题目: Can Computer Help Teachers in Grading of Examination paper?

**报告摘要:** Abstract: Automation in the field of education has received special attention from researchers to address several open challenges. One such open challenge is to develop systems for automatically grading/evaluating descriptive answers of examination in contrast to the existing methods developed for evaluating short answers and objective type questions. In this talk we will discuss grading techniques of the descriptive answers written by different students without any constraints. There are many challenges in such evaluation, and we will discuss the challenges including the writing patterns. The notion of this evaluation is that the schema provides important keywords that are relevant to answers. Based on the keywords and semantics analysis of the text, the proposed work grades the examination paper. For better understanding some demonstrations will be shown to the audience.



**个人简介:** Shengzhong Liu is a Tenure-Track Associate Professor at the Department of Computer Science and Engineering at Shanghai Jiao Tong University. He received his Ph.D. from the University of Illinois at Urbana-Champaign, USA in 2021. His research focuses on intelligent Internet of Things (IoT) and real-time edge computing. He has published more than 40 papers in top-tier conferences and journals including RTSS, UbiComp, SenSys, WWW, INFOCOM, ICML, and NeurIPS. He is a recipient of NSFC Distinguished Young Scholar (Overseas), Intel China Academic Talent, and Xiaomi Young Scholar, as well as 6 best/outstanding paper awards from

international conferences like RTSS, SenSys, UbiComp, and RTAS.

### 报告题目: On Exploring Robust Foundation Models for Multi-Modal IoT Signals

**报告摘要:** With the explosion of large language models (LLM), artificial intelligence has been evolving from domain-specific intelligence to cross-domain foundational intelligence, which is built on efficient self-supervised model pretraining. However, standard self-supervised algorithms such as contrastive learning and masked autoencoders often exhibit poor generalizability when faced with challenges of information sparsity, noise interference, and domain shifts in IoT applications using multi-modal time-series data. Additionally, different from text and images, the data scale required for effective self-supervised pretraining is often difficult to meet for IoT signals. This talk reports our recent explorations on building foundation models for multi-modal IoT signals, focusing on the progress and experiences in achieving robust multi-task and cross-domain generalization, by designing efficient pretraining algorithms and data enrichment techniques to fully exploit low-quality, asymmetric, and limited-scale multimodal signals.

## 嘉宾介绍

Guest Introduction

## 大会报告嘉宾 (9月29日上午)



**个人简介:** Wensheng Zhang received his Ph.D. degrees from the Institute of Automation, Chinese Academy of Sciences (CAS), and at present he is a Professor, Ph.D. Tutor and Deputy Chief Engineer of the Institute of Automation, CAS, Chief Professor of Artificial Intelligence at University of CAS, and Dean of the CAS-Medic Institute of Artificial Intelligence. He serves as the Key Group Expert of National Key Program of China “Cloud Computing and Big Data” and “Internet of Things and Smart City”, Evaluation Expert of National Natural Science

Foundation of China, Judge of China Science of Technology Awards, Vice Chairman of Internet of Things Working Committee of China Instrument and Control Society, Deputy Director of Intelligent Service Committee of China Artificial Intelligence Society and Intelligent Control Committee of China Automation Society, Secretary General of Graphical and Human-Computer Interaction Committee of China Automation Society, etc. He has wide research interests, mainly including artificial intelligence, machine learning, pattern discovery of big data, cross-media analysis and reasoning, etc. He has published more than 170 papers in top-tier international journals/conferences, obtained more than 70 domestic and foreign patents, 1 second prize for China Science and Technology Progress Award, and 5 second prizes for Provincial/Ministerial Science and Technology Award.

**报告题目:** Tensor Multi-Elastic Kernel Self-Paced Learning for Time Series Clustering

**报告摘要:** Among all time series analysis techniques, time series clustering is one of the most widely used methods, as it can identify interesting patterns in the absence of supervision, and facilitate other data analysis tasks, such as classification, anomaly detection, and indexing. The unique characteristics of time series, including high-dimension, warping and the integration of multiple elastic measures, pose challenges for the present clustering algorithms, most of which take into account only part of these difficulties. We make an effort to simultaneously address all aforementioned issues in time series clustering under a unified multiple kernels clustering method. The proposed approach can be extended to more challenging multivariate time series clustering scenario in a direct but elegant way. Extensive experiments on 85 univariate and 10 multivariate time series datasets demonstrate the significant superiority of the proposed approach beyond the baseline and several state-of-the-art MKC methods.



**个人简介:** 叶晓虎博士，绿盟科技集团首席技术官。长期从事网络安全研究开发工作，在异常流量治理技术创新、研发、产品化和应用方面取得成果。承担多个国家级重点项目，多次获得省部级奖励。绿盟科技是国内网络安全行业的龙头企业，有近两百名专职安全研究人员，在云安全、人工智能、漏洞挖掘等多个领域展开研究，相关的研究成果得到了国内外同行及主管机关的高度认可。

**报告题目:** 大模型赋能网络安全运营和对抗应用进展和问题

**报告摘要:** 绿盟科技团队在 AI 赋能网络安全领域开展了深入的研究并应用在攻防实战中，本报告汇总团队取得的主要成果和问题。风云卫是绿盟

科技以大模型为核心，结合安全知识图谱、知识库及 AI 小模型，融入各类安全能力与工具打造的 AI 安全能力平台。本次演讲介绍 AI 安全能力平台构建中两大挑战即数据工程和问题工程的应对思路，并总结风云卫在安全事件分析和攻防对抗的实践进展。风云卫在安全事件的降噪推荐和研判分析、溯源调查以及响应处置的运营闭环已经形成了不少应用案例。通过攻防对抗智能体的研究，把智能体应用在实战攻防演练和渗透测试服务中，也取得了一定的进展。在这基础上，本次演讲还提出了对处理不同专业任务所需的多智能体及模型应用的协同思路，以及 AI 辅助发现高级威胁的框架思路和研究进展。





**个人简介:** Haibin Duan is a Full Professor with the School of Automation Science and Electrical Engineering, Beihang University, Beijing, China. He is the Head of the Bio-Inspired Autonomous Flight Systems (BAFS) Research Group, Beihang University, Beijing, China. He received the National Science Fund for Distinguished Young Scholars of China in 2014. He is also enrolled in the Chang Jiang Scholars Program of China, Scientific and Technological Innovation Leading Talent of "Ten Thousand Plan" -National High Level Talents Special Support Plan, and Top-

Notch Young Talents Program of China, Program for New Century Excellent Talents in University of China, and Beijing NOVA Program. He has authored or coauthored more than 90 publications. He is the Editor-in-Chief of Guidance, Navigation and Control, deputy Editor-in-Chief of Acta Automatica Sinica, Associate Editor of the IEEE Transactions on Cybernetics, IEEE Transactions on Circuits and Systems I: Regular Papers and IEEE Transactions on Circuits and Systems II: Express Briefs. His current research interests are multi-UAV swarm autonomous control, bio-inspired intelligence, and biological computer vision.

**报告题目:** UAV Swarm Inspired by Bird Flock Intelligence Incentive and Convergence

**报告摘要:** Nature is a rich source of human creativity. On the basis of a series of flight experiments on bird flock behavior in nature, the internal mechanism of different behavior phenomena of birds is analyzed through collecting and processing the experimental data of different flight behavior of birds, and the bird flock intelligence incentive and convergence behaviors are modeled. The positive and negative feedback mechanism model of bird flock intelligence emergence is constructed. The mapping relationship between the bird flock intelligence incentive and convergence and the flight of unmanned aerial vehicles (UAVs) is studied. Inspired by the different behavior models of bird flock intelligence incentive and convergence, the UAV cooperative searching method based on the bird flock intelligence incentive and the UAV swarm countermeasure method based on the bird flock intelligence convergence are proposed. The recent progresses in incentive and convergence in bird flock intelligence will also be highlighted.



**个人简介:** Long Cheng received the B.S. (Hons.) degree in control engineering from Nankai University, Tianjin, China, in 2004, and the Ph.D. (Hons.) degree in control theory and control engineering from the Institute of Automation, Chinese Academy of Sciences, Beijing, China, in 2009. He is currently a Full Professor with the Institute of Automation, Chinese Academy of Sciences. He is also an adjunct Professor with University of Chinese Academy of Sciences. He has published over 200 technical papers

in peer-refereed journals and prestigious conference proceedings. He was a recipient of the IEEE Transactions on Neural Networks Outstanding Paper Award from IEEE Computational Intelligence Society, the Aharon Katzir Young Investigator Award from International Neural Networks Society and the Young Researcher Award from Asian Pacific Neural Networks Society. He is currently serving the Associate Editor/Editorial Board Member of IEEE/ASME Transactions on Mechatronics, IEEE Transactions on Cybernetics, IEEE Transactions on Automation Science and Engineering, IEEE Transactions on Cognitive and Developmental Systems, Science China Information Sciences, Science China Technological Sciences, and Acta Automatica Sinica.

Dr. Cheng is a Fellow of the IEEE/IET.

**报告题目:** Intelligent Human-Machine Interaction for Wearable Robots

Wearable robots have extensive applications in various labor-intensive industries such as rehabilitation care, elderly and disabled assistance, and unloading and transportation. Achieving natural human-machine interaction between wearable robots and users is a highly challenging task.

**报告摘要:** This talk aims to introduce some recent challenges and advances on the human-machine motion compliant mechanical design, sensing and understanding technologies for human-robot interaction, and active interactive control techniques based on the intention of users.



**个人简介:** 程徐, 国家优秀青年基金获得者, 欧盟玛丽居里学者, 入选人社部海外青年人才引进专项, 现为天津理工大学计算机学院教授, 博士毕业于挪威科技大学与天津理工大学获海洋工程与工学双博士学位, 曾任职挪威智能创新署终身研究员。主持的项目包括国家优秀青年基金, 海外青年人才引进专项, 国家自然科学基金青年基金项目, 欧盟地平线项目, 中国国际合作项目(挪威方), 总经费超过一千五百万人民币。在国际知名期刊会议发表文章七十多篇。担任多个国际期刊编委, 获得天津优秀博士学位论文以及多个国际会议最佳论文奖。

**报告题目: Ship Motion Data-driven Sea State Estimation for Autonomous Ships**

自主船舶的自主航行要求其具备实时、可靠的海况估计能力。然而,传统方法如人工观测、浮标、气象卫星和波浪雷达,分别受限于主观性、部署区域、环境干扰和成本等因素。为克服这些局限,利用船舶自身运动数据

**报告摘要:** 进行海况估计成为新思路。该方法将船舶视为移动浮标,通过分析其运动响应推断海况信息。现有方法主要分为基于模型和数据驱动两类。前者依赖数学模型描述船舶与波浪的相互作用,但易受复杂海洋环境影响;后者,特别是深度学习,可自动提取特征、实现自适应预测,展现出巨大潜力。尽管前景广阔,基于深度学习的海况估计仍面临以下挑战:高效的特征提取:如何从复杂的船舶运动数据中提取有效特征,是提升模型性能的关键。跨平台信息迁移:不同类型海洋结构物的运动数据存在差异,如何实现信息迁移,构建普适性模型至关重要。数据-知识双驱动建模:如何将现有的海洋工程领域知识融入数据驱动模型,实现更准确、可靠的海况估计。鲁棒性与安全性:如何有效抵御恶意数据攻击,保障海况估计系统的鲁棒性和安全性。解决这些挑战,对于推动基于船舶运动数据的自主船舶海况估计技术发展,实现更加安全、智能的海洋航行具有重要意义。



**个人简介:** Massimo Tistarelli received the Phd in Computer Science and Robotics in 1991 from the University of Genoa. He is Full Professor in Computer Science (with tenure) and director of the Computer Vision Laboratory at the University of Sassari, Italy. Since 1986 he has been involved as project coordinator and task manager in several projects on computer vision and biometrics funded by the European Community.

Since 1994 he has been the director of the Computer Vision Laboratory at the Department of Communication, Computer and

Systems Science of the University of Genoa, and now at the University of Sassari, leading several National and European projects on computer vision applications and image-based biometrics.

Prof. Tistarelli is a founding member of the Biosecure Foundation, which includes all major European research centers working in biometrics. His main research interests cover biological and artificial vision (particularly in the area of recognition, three-dimensional reconstruction and dynamic scene analysis), pattern recognition, biometrics, visual sensors, robotic navigation and visuo-motor coordination. He is one of the world-recognized leading researchers in the area of biometrics, especially in the field of face recognition and multimodal fusion. He is coauthor of more than 150 scientific papers in peer reviewed books, conferences and international journals. He is the principal editor for the Springer books "Handbook of Remote Biometrics" and "Handbook of Biometrics for Forensic Science".

Prof. Tistarelli organized and chaired several world-recognized several scientific events and conferences in the area of Computer Vision and Biometrics, and he has been associate editor for several scientific journals including IEEE Transactions on PAMI, IET Biometrics, Image and Vision Computing and Pattern Recognition Letters.

Since 2003 he is the founding director for the Int.I Summer School on Biometrics (now at the 21st edition – <http://biometrics.uniss.it>). He is a Fellow member of the IAPR and Senior member of IEEE, and he served as Vice President of the IAPR and the IEEE Biometrics Council. In 2022 he has been awarded the "Meritorious Service Award" from the IEEE Biometrics Council.

**报告题目: Human Face Recognition: Learning from Biological Deep Networks**

Face Recognition has been extensively studied as a mean to facilitate man-machine interaction in a variety of different applications. Due to the imaging variabilities and to the complex nature of the

**报告摘要:** face shape and dynamics, analyzing and recognizing human faces from digital images is still a very complex task.

In the last decade deep learning techniques have strongly influenced many aspects of computational vision. Many difficult vision tasks can now be performed by deploying a properly tailored and trained deep network. Oxford University's VGG-face is possibly the first deep convolutional network designed to perform face recognition, obtaining unsurpassed performance at the time it was firstly proposed.

The enthusiasm for deep learning is unfortunately paired by the present lack of a clear understanding of how they work and why they provide such brilliant performance. The same applies to Face Recognition.

Over the last years, several and more complex deep convolutional networks, trained on very large, mainly private, datasets, have been proposed still elevating the performance bar also on quite challenging public databases, such as the Janus IJB-A and IJB-B. Despite of the progress in the development of such networks, and the advance in the learning algorithms, the insight on these networks is still very limited. For this reason, in this talk we analyse the neural architecture of the early stages of the human visual system to devise a biologically-inspired model for face recognition. The aim is not pushing the recognition performance further, but to better understand the representation space produced from a deep network and how it may help explaining the process undergoing a real biological neural architecture.

In this talk we analyse an hybrid model network trying to better understand the role of the different layers, including the retino-cortical mapping simulated by a log-polar image resampling. The following issues will be addressed:

- What is the representation space within a deep convolutional network and how this reflects the organization of the human visual cortex.
- How the retino-cortical mapping, implemented in the human visual system, may impact the representation space, hence improving the classification performance.
- The relevance of peripheral vs foveal vision, coupled with visual attention, for face recognition.



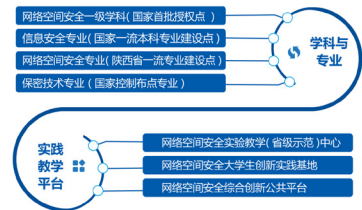
## 网络空间安全学院

### 学院简介

西北工业大学是我国最早开展信息安全相关专业人才培养的高校之一，历史沿革底蕴深厚。网络空间安全学院成立于 2018 年 6 月，并于 2024 年 1 月入选第三批一流网络安全学院建设示范项目。学院致力于服务国家网络空间安全战略和发展国家网信事业，培养政治素养过硬的网安领军人才和行业骨干，建设一流的网络安全学院和一流的网络空间安全学科。

学院在传承近 20 年信息安全专业人才培养历史积淀的基础上，形成了“厚基础、强系统、重实战、拓交叉”的网安人才培养模式。学院现有网络安全一级学科博士学位授权点，设有信息安全专业、网络空间安全专业、保密技术专业。

学院全面贯彻新时代人才工作新理念，坚持人才引领发展战略地位。已形成了一支以杰出学者和高水平学科带头人为核心的高水平师资队伍，学科现有博导 35 人、硕导 68 人。近三年学院新增专职国家级人才 4 人，国防科技创新团队 1 个，柔性引进国家级人才 11 人，其中包括中国工程院院士、IEEE Fellow、国家杰青等专家。



### 科学研究

西北工业大学从九十年代就在国内较早地开展了网络空间安全领域的科学研究，二十多年来，面向国家重大战略和国防建设需求，在网络空间安全领域形成了系统软硬件安全、无人系统与物联网安全、多媒体大数据安全、信息内容与认知对抗安全、人工智能安全五个特色研究方向，并在相关领域取得了一系列国际国内先进的科研成果。自 2018 年建院以来，学院围绕国家战略需求，重点针对航空、航天、航海等优势领域的网络空间安全基础理论和工程应用“卡脖子”难题，以科研平台为抓手，服务科学研究和人才培养。在网络空间安全领域承担国家重点研发计划、国家自然科学基金等多项国家级重大重点科研任务，研制的许多产品在国防和安全部门得到推广应用。



## 组织架构 Organizing Committee

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## 会议笔记

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绿盟科技风云卫大模型AI安全能力平台

绿盟科技风云卫大模型是基于海量安全专业知识训练而构建的一套覆盖安全运营、检测响应、攻防对抗和知识问答等多种场景的网络安全运营辅助决策系统。该系统聚焦实战态势指挥调度、红蓝对抗辅助决策以及安全运营效能提升等关键问题,是安全行业垂直领域大模型应用的重要创新与突破,让AI重塑安全运营新认知新体验。

直击痛点

1

告警风暴

「百万级安全事件、告警、日志」

2

运营疲劳

「93%以上无法妥  
当处置当天告警」

3

攻防失衡

「从失陷到发现平均99天  
攻击者驻留时间平均141天」

赋能安全运营

增强安全对抗

辅助安全研究

构建AI安全能力平台

大模型安全威胁评估

AI重塑安全运营新认知新体验

AI+安全运营

告警降噪  
安全事件调查  
处置建议  
报告生成

AI+实战攻防

暴露面(EASM)评估  
攻防工具调用  
智能渗透测试

AI+安全监测

报文解析  
恶意代码检测  
Web攻击检测

AI+数据安全

敏感数据发现  
数据分类分级  
分类分级规则生成

AI安全专家

智能化基座

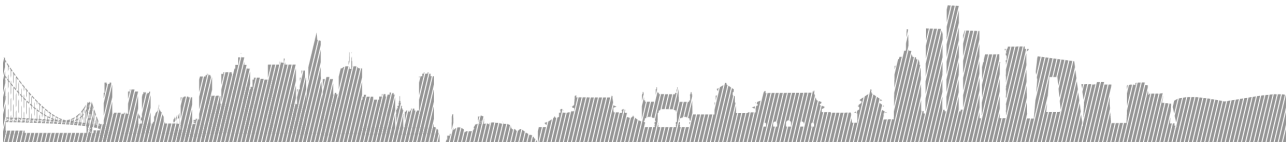
数字化治理

场景化应用

体系化运营

THE EXPERT BEHIND GIANTS  
巨人背后的专家

多年以来,绿盟科技致力于安全攻防的研究,为政府、金融、运营商、能源、交通、科教文卫等行业用户和各类型企业用户,提供具有核心竞争力的安全产品及解决方案,帮助客户实现业务的安全顺畅运行。在这些巨人的背后,他们储备着值得信赖的专家







## 绿盟科技安全研究能力

绿盟科技深耕网络安全行业多年,一向视研究能力为企业发展的根基,注重持续加强和打造立足实战化的网络安全研究队伍,于2000年成立之初就优先建立了绿盟科技研究院。研究院始终致力于网络安全实战能力研究,立足国内外网络安全动向的长期跟踪,持续开展场景化、体系化和实战化安全研究,并将研究成果应用于企业产品技术和服务创新,不断完善网络攻防对抗体系与手段、提升威胁情报感知和智能分析决策技术水平,全面助力绿盟科技“智慧安全”理念的落地实现。

### 多维度多领域的安全研究成果

- 连续7年获得微软Bounty Programs计划奖励,连续6年获得微软缓解措施绕过技术悬赏MBB项目奖金
- 率先披露并独立命名APT组织Lorec53(洛瑞熊)、MurenShark(穆伦鲨)
- 天机实验室张云海获得Pwnie Awards“最佳提权漏洞”和“最佳服务端漏洞”两项提名
- 天机实验室史龙安以第29名的成绩荣登微软(MSRC)2021年度Q4季度的“全球安全研究员榜”,同时,以第2名的成绩入选“Office安全研究员榜”
- 绿盟科技天机实验室负责人张云海受邀为Black Hat Asia 2022(亚洲黑帽大会)发表主题演讲

#### 省部级奖励

- DDoS攻击检测、溯源与团伙追踪关键技术及国家级应用,中国电子学会科学技术奖一等奖
- 关键信息基础设施网络资产发现及威胁监测技术与应用,中国通信学会科学技术奖二等奖
- 面向骨干网的异常流量多维度治理技术研发及应用,北京市科学技术奖二等奖
- “网络空间大规模关键信息基础设施安全态势感知关键技术研发及应用”,北京市科学技术奖二等奖

#### 学术论文

- Wenmao Liu, et al., An Evolutionary Study of IoT Malware, IEEE Internet of Things Journal, 2021 (SCI1区, IF 9.936, 物联网安全顶刊)
- Wenmao Liu, et al., One Host with So Many IPs! On The Security Implications of Dynamic Virtual Private Servers, IEEE Communications Magazine, 59(2),2021 (SCI IF:11.052)
- Wenmao Liu, Hongqing Sang, et al., Landing Reinforcement Learning onto Smart Scanning of The Internet of Things, Infocom 2022 (CCF-A, 计算机顶会)
- Yifei Chen, et al., Nereus: Anonymous and Secure Ride-Hailing Service based on Private Smart Contracts, IEEE Transactions on Dependable and Secure Computing (CCF-A), 2022
- Yifei Chen, et al., Astraea: Anonymous and Secure Auditing Based on Private Smart Contracts for Donation Systems, IEEE Transactions on Dependable and Secure Computing (CCF-A), 2022
- 刘雪花,刘文燃等,一种基于软件定义安全和云取证趋势分析的云取证方法,计算机研究与发展,2019 (CCF-A)

#### 攻防比赛

- 2018-2022年,连续五年荣获“湖湘杯”网络安全应急演练最高奖项
- 2022年第五届“强网”拟态防御国际精英挑战赛一等奖
- 2022年广州市网络安全实战攻防演练第一名
- 2021年第二届全国电信和互联网行业职业技能竞赛一等奖
- 2020年全国工业互联网安全技术技能大赛职工组一等奖
- 2020年第三届车联网信息安全技能大赛一等奖





西北工业大学  
NORTHWESTERN POLYTECHNICAL UNIVERSITY

西北工业大学(简称西工大)坐落于陕西西安,是一所以发展航空、航天、航海等领域人才培养和科学研究为特色的国家“双一流”建设高校,隶属于工业和信息化部。学校1960年被国务院确定为全国重点大学,“七五”“八五”均被国务院列为国家重点建设高校之一,1995年首批进入“211工程”,2001年进入“985工程”,2017年进入“一流大学”建设高校(A类)行列,是“卓越大学联盟”成员高校,是“一带一路”航天创新联盟发起高校。建校以来,学校全面贯彻党的教育方针,秉承“公诚勇毅”校训,弘扬“三实一新”(基础扎实、工作踏实、作风朴实、开拓创新)校风,确定了“五个以”(以学生为根、以育人为本、以学者为要、以学术为魂、以责任为重)的办学理念。在扎根西部、献身国防的建设历程中,学校始终坚持立德树人、育领军人才,始终坚持科技创新、铸国之重器,始终坚持与时俱进、担时代大任,为党和国家事业发展作出了重要贡献,书写了新中国历史上的多个“第一”,为武器装备研制、国防领域关键核心技术自主安全可控和西部建设提供了有力支撑,是连续两次被中共中央、国务院、中央军委联合授予“重大贡献奖”的唯一高校。学校先后获得“全国文明单位”“全国文明校园”“全国毕业生就业典型经验高校”“全国民族团结进步模范集体”“全国创先争优先进基层党组织”“全国党建工作示范高校”等荣誉称号和表彰奖励。

学校现有学生37000余名,教职工4100余人,包括全时两院院士11人,国家级教学名师10人,国家级领军人才169人,国家级青年人才185人,以及一大批行业领域专家、型号总师等国家级专家。学校占地面积310余万平方米,拥有72个本科专业,39个硕士学位授权一级学科,29个博士学位授权一级学科。机械工程、材料科学与工程、航空宇航科学与技术3个学科入选国家第二轮“双一流”建设学科。材料科学、工程学、化学、物理学、计算机科学、地球科学、数学、生物学与生物化学、临床医学、环境学/生态学和农业科学11个学科进入ESI国际学科排名前1%,其中,材料科学、工程学、计算机科学3个学科进入前1‰,形成了以三航(航空、航天、航海)学科群为引领,3M(材料、机械、力学)学科群、3C(计算机、通信、控制)学科群、理科学科群、人文社科学科群和交叉学科协调发展的学科体系。

