清华大学智能产业研究院
Institute for AI Industry Research, Tsinghua University

AIR.THU

01 AIR Talent

After a 2-year development, AIR has built a multi-disciplinary world-class research and innovation team with top international scientists, industrial innovation leaders, and young researchers. The faculty consists of **members of Chinese Academy of Engineering**, **US National Academy of Engineering**, **American Academy of Arts and Sciences**, **Australia National Academy of Engineering**, **ACM/IEEE Fellows**, and **Chinese national academic honours** as well.

We currently have 22 faculties, 15 post-doc and PhD students, and over 100 research staff and interns, in the area of AI/machine learning, autonomous driving, biological computing, green computing, advanced robotics, and data analytics.

In the last six months,
AIR continued to bring in a number of distinguished scientists.

Jinbo Xu Distinguished Visiting Professor

Professor of Toyota Technological Institute at Chicago; editorial board member of Bioinformatics; winner of Sloan Research Fellowship Award, NSF Early Career Award, PLoSComputational Biology Innovation Breakthrough Award, RECOMB Best Paper Award and Test-of-Time Award at the top international conference on computational biology. Keynote speaker at the Future Science Awards Forum in 2021 and guest speaker at the Nobel Forum in 2022.

Peng Li Associate Professor/Associate Researcher

Ph.D, Tsinghua University, former principal researcher and team leader at WeChat AI, Tencent. He was awarded the First Prize of Qian Weichang Chinese Information Processing Science and Technology Award and Second Prize of Chinese Institute of Electronics Science and Technology Progress Award.

Hao Zhou Associate Professor/Associate Researcher

Ph.D, Nanjing University, former research scientist and manager at ByteDance AI Lab. He was the recipient of Chinese Association of Artificial Intelligence 2019 Doctoral Dissertation Award, ACL 2021 Best Paper Award and CCF NLPCC Distinguished Young Scientist.

Prof. Yunxin Liu was selected for the National High-Level Talent Program for his important contributions in the research areas of Internet of Things, mobile computing and edge computing.

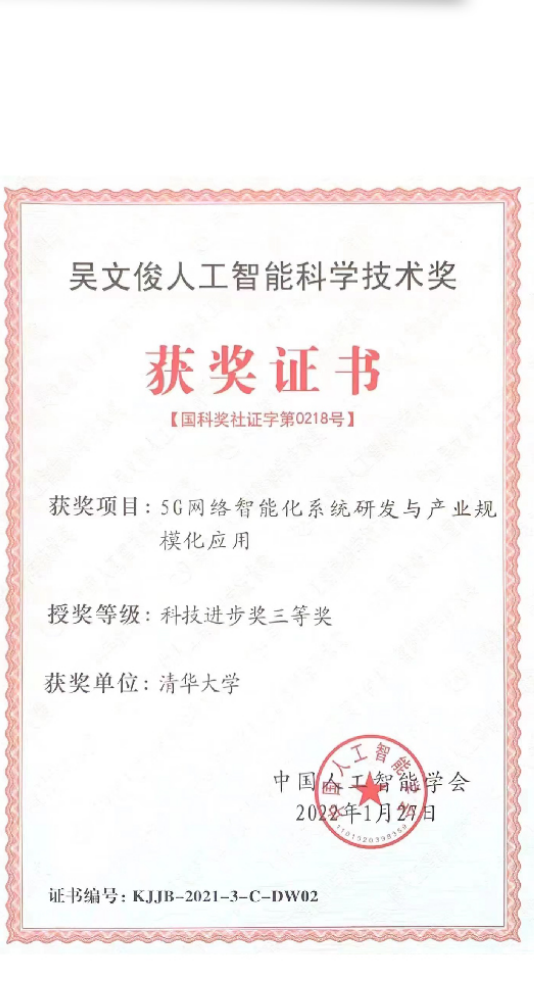
Assistant Professor Weizhi Ma was selected for the Young Talent Support Project for his outstanding performance in the area of text retrieval, mining and information extraction.

Dr. Yuan Hu Allegretti was awarded "Shuimu Scholar", one of the high-level young talents cultivating programs of Tsinghua University.

02 Research Achievements

Jan.

In January, the "5G Network Intelligent System R&D and Industrial Scale Application" jointly completed by AIR and AsiaInfo was awarded the third prize of the "2021 Wu Wen Jun Artificial Intelligence Science and Technology Progress Award". This achievement has achieved a comprehensive improvement in the level of artificial intelligence technology in the telecommunications industry, greatly improved the efficiency of operation and maintenance/operation, and played a significant role in technological progress and industrial structure optimization and upgrading of the telecommunications industry.



吴文俊人工智能科学技术奖

获奖证书

【国科奖社证字第0218号】

获奖项目：5G网络智能化系统研发与产业规模化应用

授奖等级：科技进步奖三等奖

获奖单位：清华大学

中国人工智能学会
2022年1月27日

证书编号：KJJB-2021-3-C-DW02

Feb.

In February, the world's first Vehicle-Infrastructure Cooperative Autonomous Driving dataset, DAIR-V2X, was officially released and made available for download to users in China. The dataset is jointly released by AIR, Beijing High-Level Automated Driving Demonstration Zone, CARSMART, Baidu Apollo and Beijing Academy of Artificial Intelligence(BAAI). The research paper titled "DAIR-V2X: A Large-Scale Dataset for Vehicle-Infrastructure Cooperative 3D Object Detection" was accepted by CVPR 2022.

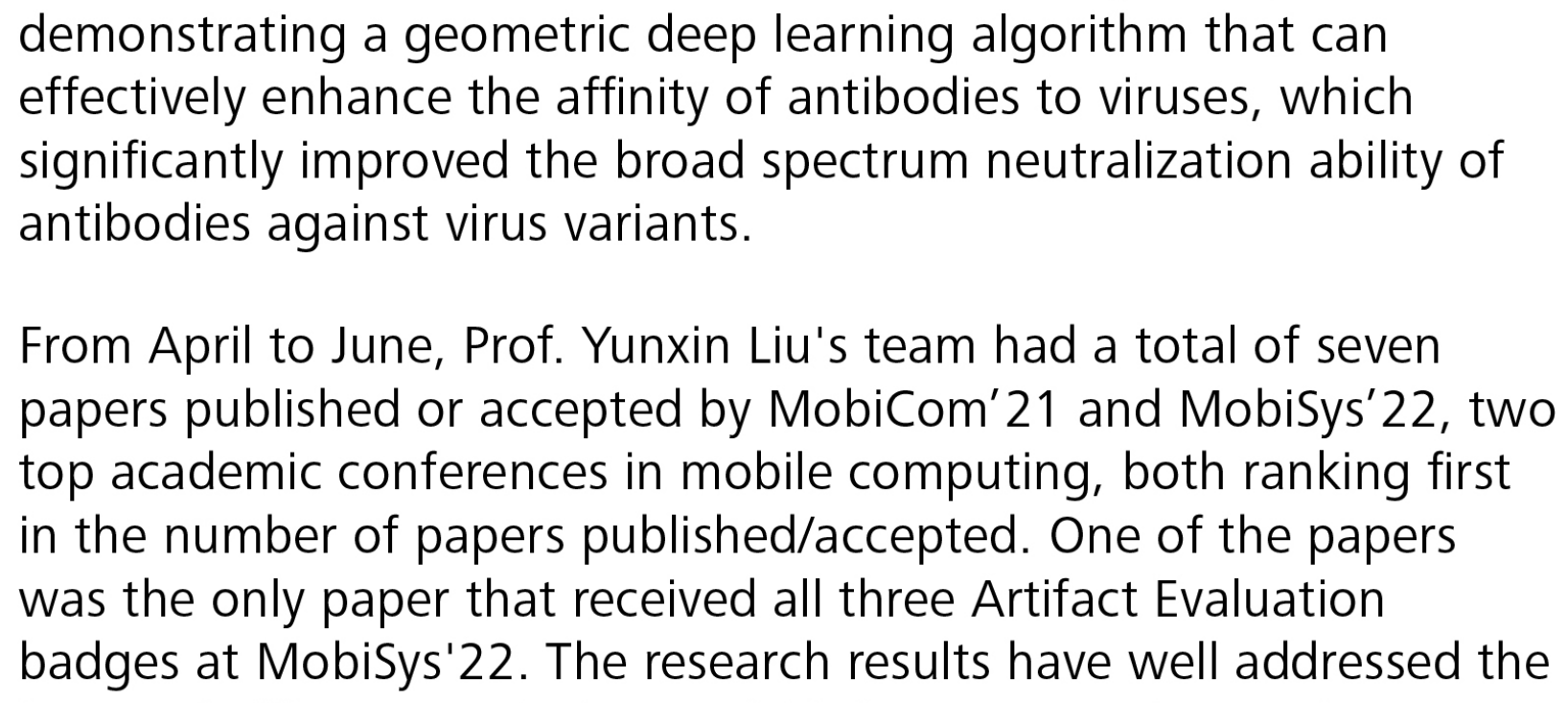
全球首个车路协同自动驾驶数据集DAIR-V2X隆重发布

Mar.

In March, Prof. Peng Jian's team published a paper "Deep Learning Guided Optimization of Human Antibody Against SARS-CoV-2 Variants with Broad Neutralization" in the PNAS journal, demonstrating a geometric deep learning algorithm that can effectively enhance the affinity of antibodies to viruses, which significantly improved the broad spectrum neutralization ability of antibodies against virus variants.

Apr.-Jun.

From April to June, Prof. Yunxin Liu's team had a total of seven papers published or accepted by MobiCom'21 and MobiSys'22, two top academic conferences in mobile computing, both ranking first in the number of papers published/accepted. One of the papers was the only paper that received all three Artifact Evaluation badges at MobiSys'22. The research results have well addressed the issues of efficient on-device model inference, training, task offloading, object detection for high-resolution images, and privacy protection for AI-powered video analysis.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Student Info
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About
MobiCom 2021
The 27th Annual International Conference On Mobile Computing And Networking
New Orleans, United States
The Royal Sonesta New Orleans Hotel

May.

In May, Associate Professor Yang Liu published a paper titled "Contribution-Aware Federated Learning for Smart Healthcare", which provides a valid and accurate method to fairly evaluate the contribution of federated learning participants to model performance without exposing private data. The paper has won the AAAI-IAAI 2022 Award for Innovative Applications of Artificial Intelligence, bringing significant enhancements to the industrial application of smart healthcare.

Jun.

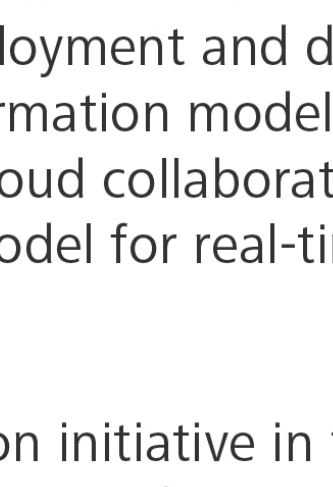
In June, DAIR Lab proposed the DAIR-Health personalised nutrition and health management technology framework, which includes "nutrition and health knowledge mining", "retrieval-enhanced pre-training models for nutrition and health scenarios" and "interpretable personalised recommendations for nutrition and health management". The framework addresses a number of technical challenges in data-driven personalised nutrition and health management.

Jun.

In June, Dr. Yan Wang and SenseTime jointly published two papers at CVPR, including highly efficient end-to-end lossy image compression and the first end-to-end lossless recompression

03 Industrial Collaboration

2021.12 » AIR, together with AsiaInfo, China Mobile, China Telecom and Intel, jointly released the white paper "Telecommunications Artificial Intelligence Empowering Autonomous Networks" to share the latest experience and practical achievements in the field of self-intelligent networks to the industry.



2022.01 » AIR and Midea conducted research on "Intelligent Collaborative Perception Technology for 'End-to-End Cloud' Multi-layer Distributed Architecture". A series of research was carried out, including "Sensor network deployment and data collection framework for whole house information model", "Model adaptive framework for end-side cloud collaboration", "Distributed computing architecture and model for real-time decision making.

2022.01 » AIR and HAOMO.AI launched a collaboration initiative in the field of intelligent autopilot for delivery vehicles. This collaboration focuses on developing advanced data-driven decision-making technologies for safe autonomous driving in delivery vehicles under complex urban scenarios. This joint effort is part of AIR's core technology development in the field of unmanned logistics.

2022.03 » AIR participated in the Tsinghua University-Toyota Research Institute interdisciplinary project and collaborated with Beijing Tsinghua Chang Gung Hospital in the areas of "Research and demonstration of cross-institutional federated learning technology for the medical field" and "Research and application of key technology for digital therapy for cardiovascular disease health management".

2022.04 » AIR's federated learning and data privacy protection related technologies were licensed to YiduCloud and Huakong Tsingjiao to promote the deep mining and circulation of data value across institutions.

2022.05 » AIR and GDS started a research collaboration on "Data Center AI+ Energy Efficiency Optimisation and Key Technology Research on Integrated Energy Management System" in the context of "Double Carbon" for green computing in data centers.

2022.05 » AIR collaborated with Helixon to build the HoloBioLab platform based on AI technologies such as computer vision, speech/natural language processing and mixed reality.

2022.06 » The annual meeting of the Management Committee of AIR-Baidu Apollo Intelligent Transportation Joint Research Centre was held, and the two sides clarified the cooperation in the directions of information control optimization and traffic simulation platform.

2022.06 » AIR, together with BAAI, Meituan, the Institute of Science and Technology of the National Health Commission and the Department of Obstetrics and Gynaecology, Peking University First Hospital, released "NutritionKG", a knowledge graph tailored for Chinese cuisine nutrition computing, empowering data-driven nutrition and health management.

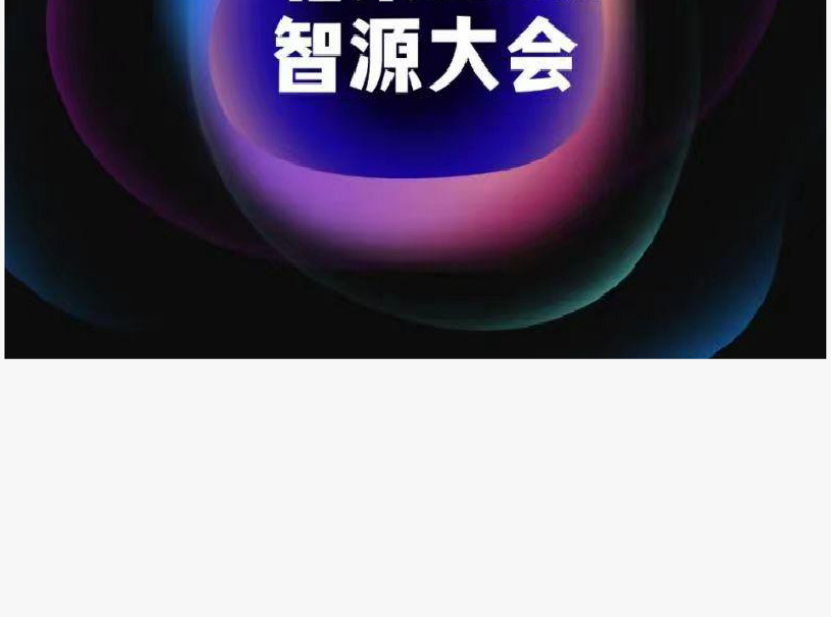
北京智源大会
AI赋能营养健康
演讲人：聂再清
清华大学智能产业研究院（AIR）
BAAI CONFERENCE

04 Academic Activities

2022
STACK-UP
全栈能动
未来汽车创新与融合共建对话
张亚勤
中国工程院院士
清华大学智能产业研究院（AIR）院长
先行

AIR faculty members actively participate in high-impact domestic and international events in the Artificial Intelligence industry. On 28 May, Dean Ya-Qin Zhang attended the 2022 Guangdong-Hong Kong-Macao Greater Bay Area Auto Show and delivered a keynote speech on the topic of future vehicles and intelligent transportation. He stressed that the core of the fourth industrial revolution is new energy, artificial intelligence and life science. In the future, AIR will continue to work jointly with its partners to promote the multi-fold innovation engine of "government + university + industry", further cooperate in the areas of technology research and development, talent training, and industrial development, provide more dynamic energy for the development of vehicle-infrastructure coordination and intelligent transportation in China, and further advance the building of national strength in transportation. On June 24, Dean Ya-Qin Zhang attended the 6th World Intelligence Conference and delivered a speech on "Intelligent Computing for 'Double Carbon'", talking about how artificial

On 25 May 2022, Associate Professor Liu Yang attended the Forum on Security, Efficiency and Open Source Ecology of federated Learning and presented a round-table discussion with a group of industry experts and scholars on the topic of "Security, Efficiency and Usability of Trusted Federated Learning". In her speech, she said that efficiency and safety in federated learning need to be developed synergistically, and that future research will also explore further methods of assessing the balance between safety and efficiency to jointly promote the frontiers of theoretical breakthrough.


刘洋
清华大学智能产业研究院教授
圆桌Panel
可信联邦学习的安全、效率及可用性

On June 1-2, 2022, four professors from AIR, including Dean Ya-Qin Zhang, Prof. Jinbo Xu, Prof. Zaiqing Nie and Prof. Jian Peng, attended the 2022 BAAI Conference and gave presentations respectively. Dean Ya-Qin Zhang elaborated on the development trend, opportunities and challenges of the autonomous driving industry; Prof. Jinbo Xu suggested that AI prediction of protein structure will lead to intelligent drug discovery; Prof. Zaiqing Nie introduced data-driven personalized nutrition and health management; Prof. Jian Peng gave a speech on

北京智源大会
BAAI CONFERENCE
2022.5.31-6.02

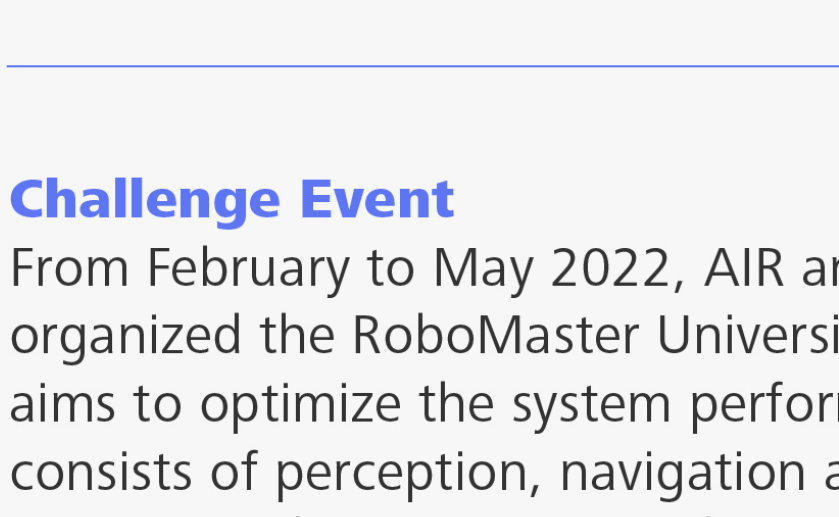
AIR regularly organizes a variety of academic activities to enhance academic exchanges, promote discipline development, and cultivate

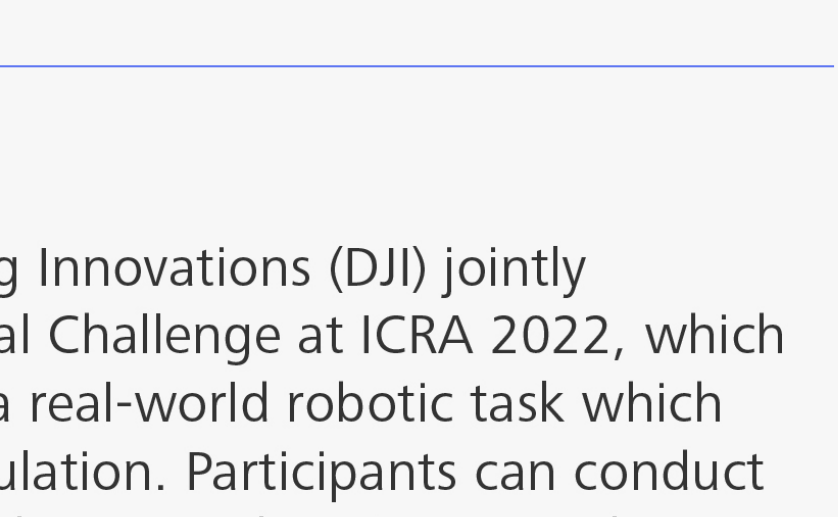
Academic Seminars

In the spring semester of 2022, AIR held 9 academic salons, with distinguished speakers invited from some of the world renowned universities, including AIR's Associate Professor Guyue Zhou, Associate Professor Xiaofan Jiang of Columbia University, Associate Professor YiXin Zhu of Peking University; Associate Dean, Prof. Joseph A. Konstan from the School of Computer Science of the University of Minnesota; Associate Professor and Doctoral Advisor Zheng Yang from the School of Software at Tsinghua University; Associate Professor Minlie Huang from the Department of Computer Science and Technology at Tsinghua University; Associate Professor Ding Zhao from the Department of Mechanical Engineering, Carnegie Mellon University; Assistant Professor Bo Li from Department of Computer Science, University of Illinois at Urbana-Champaign; Professor Guoliang Xing from the Department of Information Engineering, Chinese University of Hong Kong, and a total of nearly 40, 000 views have accumulated as of now.

AIR DISCOVER Young Scientist Forum

In the first half of 2022, AIR DISCOVER Young Scientist Forum held four sessions, inviting Assistant Professor Shuo Feng of University of Michigan, Assistant Professor Yueqi Duan from Department of Electrical Engineering, Tsinghua University, Principal Researcher Daquo Wang from MIT-IBM Watson AI Lab of IBM Research Institute, and Assistant Professor Yang Gao from Institute of Interdisciplinary Information Sciences, Tsinghua University to give academic presentations. The participants and students were enlightened by the active academic discussions with the young scientists on frontier issues.





AIR Winter Camp

In March 2022, AIR DISCOVER Lab Robotics Boot Camp concluded successfully. Mentored by AIR's young scientists, 21 undergraduate students explored and challenged themselves in the frontier fields of robotics, completing outstanding projects such as AI-based music therapy, navigation-following-based multi-mobile robot formation obstacle avoidance simulation research, and multi-modal vehicle-infrastructure cooperative simulation data set generation.

Challenge Event

From February to May 2022, AIR and Da-Jiang Innovations (DJI) jointly organized the RoboMaster University Sim2Real Challenge at ICRA 2022, which aims to optimize the system performance of a real-world robotic task which consists of perception, navigation and manipulation. Participants can conduct unrestrained experiments in the simulator, and can not directly access the real-world robot. The competition attracted 117 entries, including top universities around the world, providing a high-level communication platform for young talents in the field of global intelligent robotics, and was highly spoken by participants.

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