Fields and Applications of AI

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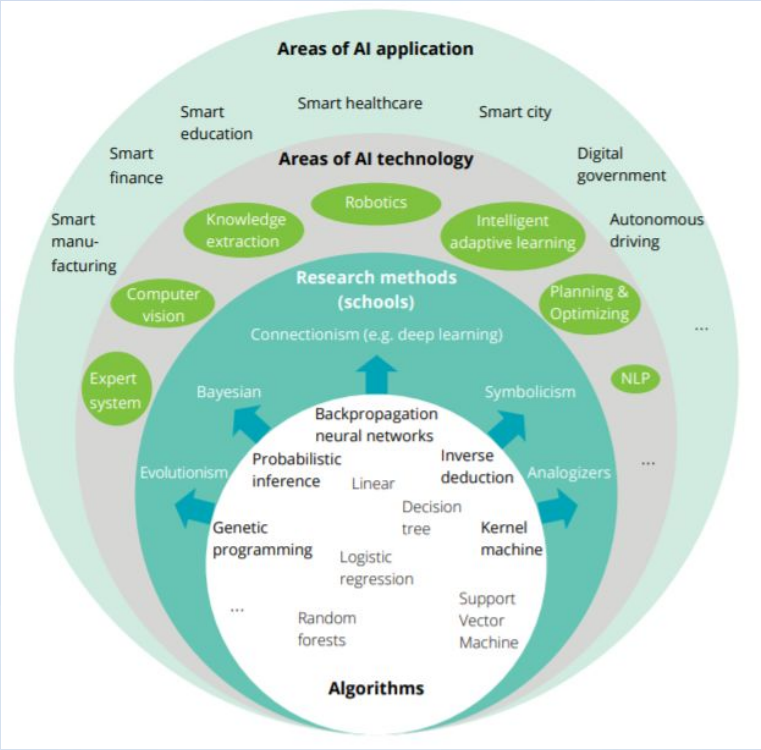
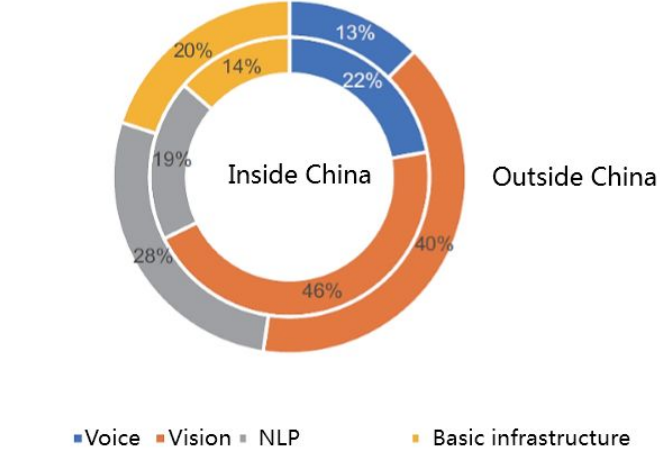
Applications and Fields



Distribution in Enterprises

At present, application directions of AI technologies mainly include:

- **Computer vision**: how to make computers "see".
- **Speech processing**: a general term for voicing process, speech recognition, speech synthesis, and speech perception.



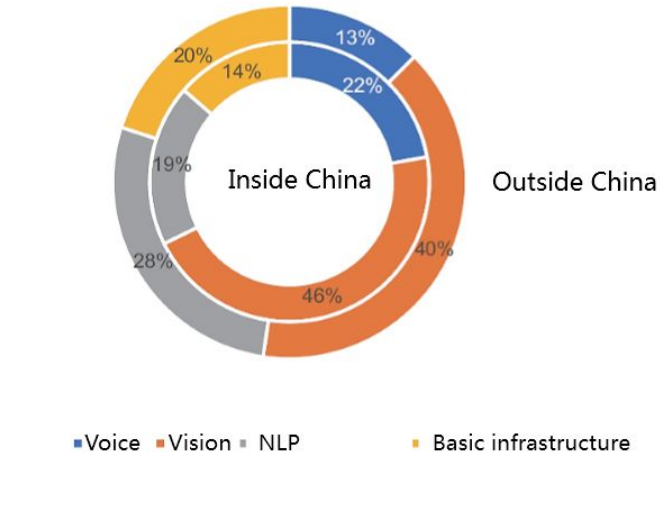
Distribution of AI application technologies in enterprises inside and outside China

China AI Development Report 2018

Distribution in Enterprises

At present, application directions of AI technologies mainly include:

- **Natural language processing (NLP)**: a field that use computer technologies to understand and use natural language.

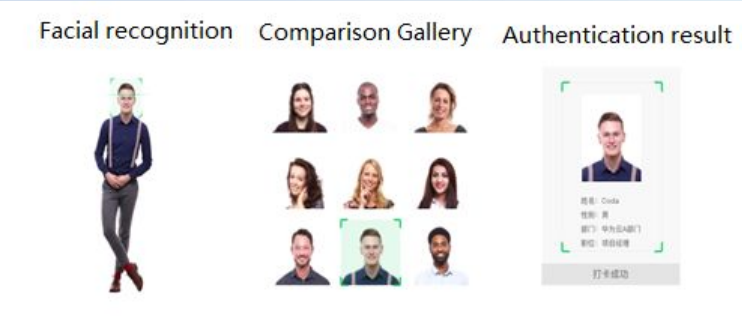


Distribution of AI application technologies in enterprises inside and outside China

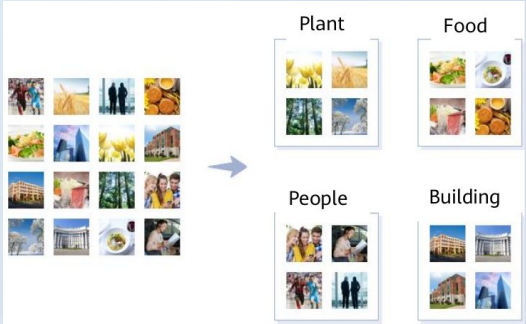
China AI Development Report 2018

Computer Vision Scenario

The most mature among the three areas of AI technologies. The main topics include image classification, target detection, image segmentation, target tracking, optical character recognition (OCR), and facial recognition.



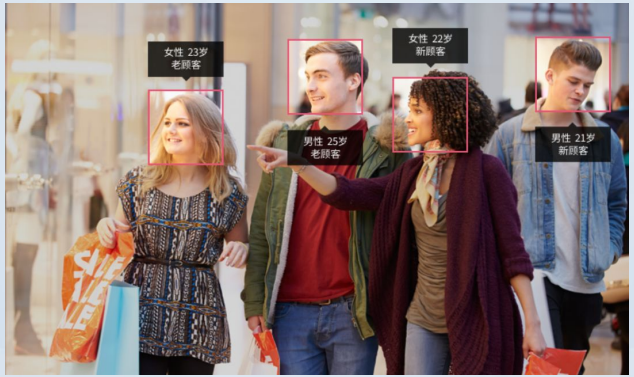
Electronic attendance



Smart album

Computer Vision Scenario

In the future, it is expected to enter the advanced stage of autonomous analysis, and decision-making, enabling machines to "see" and bringing greater value to scenarios such as unmanned vehicles and smart homes.



Traffic analysis

Computer Vision Scenario

Action analysis

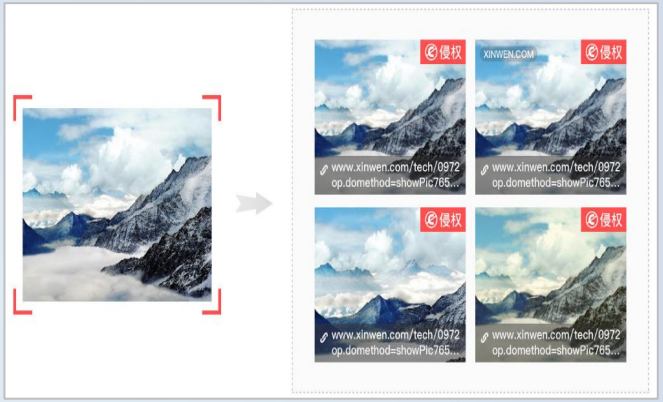


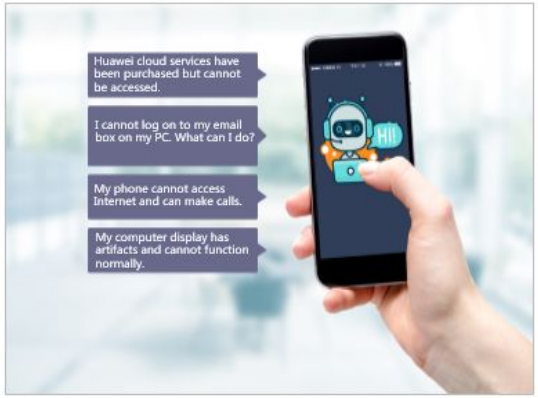
Image search

Other applications:

- Facial authentication
- Medical image analysis

Voice Processing Scenario

- The main topics include voice recognition, voice synthesis, voice wake up, voiceprint recognition, and audio-based incident detection.
- Among them, the most mature technology is voice recognition. In a quiet indoor environment, the recognition accuracy can reach 96%.



Question Answering Bot (QABot)

Voice navigation

Voice Processing Scenario

Intelligent education

Real-time conference records

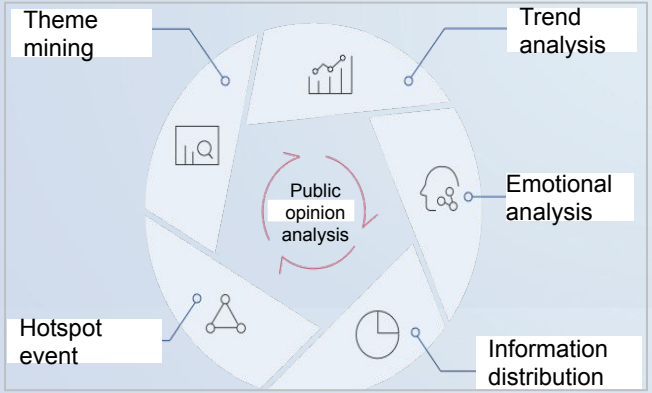
Other applications:

- Spoken language evaluation
- Speech translation

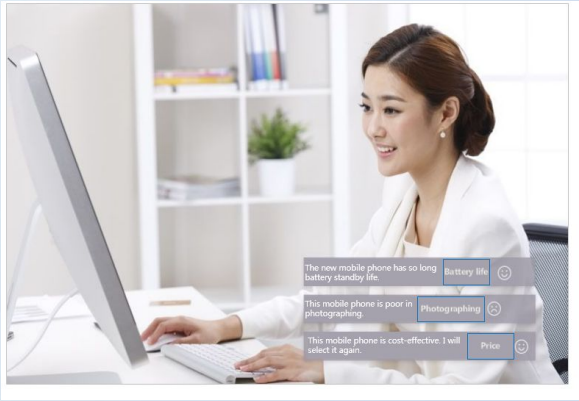
NLP Scenario

The main topics include machine translation, text mining, and sentiment analysis.

Due to high complexity of semantics, it is hard to reach the human understanding level even using parallel computing on big data.



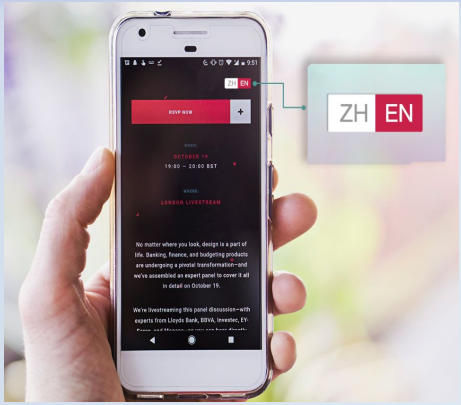
Public opinion analysis



Evaluation analysis

NLP Scenario

Machine translation



Text classification

Other applications:

- Knowledge graph
- Video subtitle generator

Areas of Applications

Intelligent Healthcare

- **Medicine mining:** quick development of personalized medicines by AI assistants
- **Health management:** nutrition, and physical/mental health management
- **Hospital management:** structured services concerning medical records
- **Assistance for medical research:** assistance for biomedical researchers in research
- **Virtual assistant:** electronic voice medical records, intelligent guidance, intelligent diagnosis, and medicine recommendation
- **Medical image:** medical image recognition, image marking, and 3D image reconstruction
- **Assistance for diagnosis and treatment:** diagnostic robot
- **Disease risk forecast:** disease risk forecast based on gene sequencing

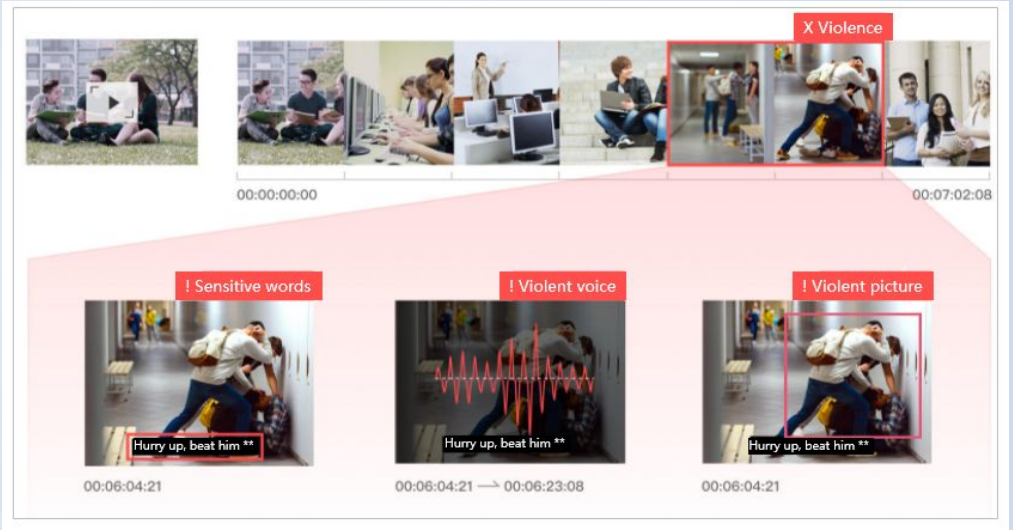
Intelligent Security

AI technologies applied in this field are relatively mature.

Involves massive data of images and videos for training of AI algorithms.

Police use: suspect identification/ tracking/search, and vehicle analysis

Civil use: facial recognition, warning against potential danger, and home protective measure deployment.



Smart Home

Based on IoT technologies, a smart home ecosystem is formed with hardware, software, and cloud platforms, providing users personalized life services and making home life more convenient, comfortable, and safe.

Control smart home products with voice processing such as air conditioning temperature adjustment, curtain switch control, and voice control on the lighting system.

Implement **home security protection** with computer vision technologies, for example, facial or fingerprint recognition for unlocking, real-time intelligent camera monitoring, and illegal intrusion detection.

Develop user profiles and recommend content to users with the help of machine learning and deep learning technologies and based on historical records of smart speakers and smart TVs.

Smart City

Social management scenarios	Public service scenarios	Industry operation scenarios	Individual application scenarios
AI + Security protection	AI + Healthcare	AI + Agriculture	AI + Life and entertainment
AI + Transportation	AI + Government	AI + Building	AI + Education
AI + Energy	AI + Service robot	AI + Retail	

Retail

For example, Amazon Go, unmanned supermarket of Amazon, uses sensors, cameras, computer vision, and deep learning algorithms to completely cancel the checkout process.

One of the biggest challenges for unmanned supermarket is how to charge the right fees to the right customers.

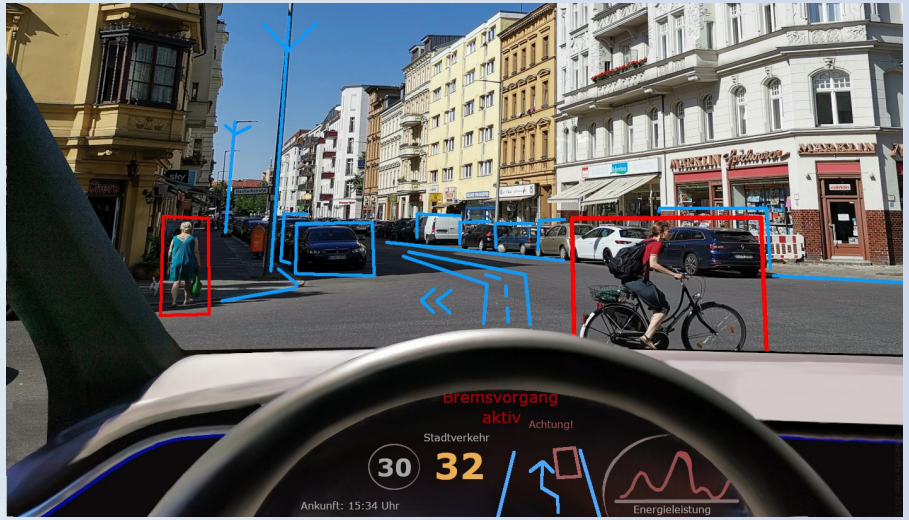
So far, Amazon Go is the only successful business case and even this case involves many controlled factors. For example, only Prime members can enter Amazon Go.

Autonomous Driving

Currently, only some commercial passenger vehicle models support **advanced driver-assistance** systems.

Fully autonomous driving is expected to be first implemented on commercial vehicles in closed campuses.

It requires further improvement of technologies, policies, and infrastructure.



AI Will Change All Industries

Public sector

- Safe City
- Intelligent transport
- Disaster prediction

Education

- Personalization
- Attention improvement
- Robot teacher

Healthcare

- Early prevention
- Diagnosis assistance
- Precision cure

Media

- Real-time translation
- Inspection

Pharmacy

- Fast R&D
- Precise trial
- Targeted medicine

Logistics

- Routing planning
- Monitoring
- Auto sorting

Finance

- Doc process
- Real-time fraud prevention
- Up-sell

Insurance

- Auto detection
- Fraud prevention

Retail

- Staff-less shops
- Real-time inventory
- Precise recommendations

Manufacturing

- Defect detection
- Predictive maintenance

Telecom

- Customer service
- Auto O&M
- Auto optimization

Oil and gas

- Localization
- Remote maintenance
- Operation optimization

Agriculture

- Fertilization improvement
- Remote operation
- Seeds development

AI: Still in Its Infancy