



中国国土勘测规划院
China Land Surveying and Planning Institute



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Opportunities and Challenges in Natural Resource Survey & Monitoring and Spatial Governance

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01

Natural Resource Survey, Monitoring,
Analysis and Evaluation

02

Territorial & Spatial Planning and
Land Use Control

03

Natural Resource Asset Use and
Rights Management



Foundamental



Non-profit



Comprehensive



Scenario-driven promotion of digital and intelligent governance transformation.



High quality

Optimization of Land Spatial Pattern



Greening

Green development of national territory and space



AI-Digitization

Perception network, governance system



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PART 01

Progress and Trend

Land and resources survey and monitoring

1.1 Actions for Land Resources Survey



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- 1931 Agricultural land survey
- 1960s 1:25000 land use status mapping
- 1978-present UKCEH countryside Survey
- 1990-present UKCEH Land Cover Maps program



- 1934 National Erosion Reconnaissance
- 1937-present Natural Resources Conservation Service Soil Survey
- 1972-present The National Resources Inventory Program
- 2001-present National Land Cover Database



- 1940s 1:800,000 land use status map
- 1950s 1:50,000 land use status map
- 1960s-1990s 10-year plans for national land survey
- 2000-present Numerical Map 5000



- 1946-1977 Soil and geological survey
- 1979 Integrated monitoring of deserts, rainforest, and agricultural lands
- Early 21st century land survey associated with ecological problems

1930s

1940s

1950s

1960s

1970s

1990s

2000s

present



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The International Land Resources Survey is Entering the Era of Intelligence

Statistical Survey

1930s-1970s

Digital Survey

1990s-2000s

Intelligent Survey

Present



1.2 Actions for Land Resources Survey



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2017-2019
3rd National Land Survey
Cloud

2007-2009
2nd National Land Survey
Map

1984-1996
1st National Land Survey
Statistics table

Institutionalization

Standardization

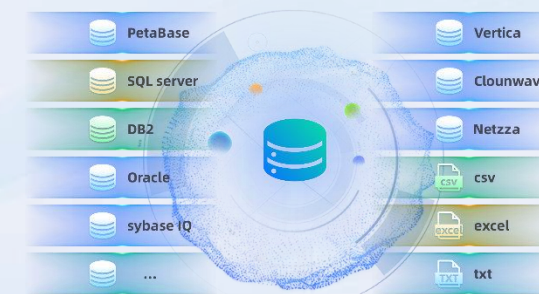
Digitalization

1st Survey: Table

- ◆ Field survey
- ◆ Aerial photography

2nd Survey: Map

- ◆ RS + field survey
- ◆ 2.5m SPOT5 satellite etc.



3rd Survey: Cloud

- ◆ "Internet +" Survey
- ◆ Sub-meter satellite data
(Domestic rate over 90%)



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1.2 Actions for Land Resources Survey



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Entering a new era of digital & intelligent ecological civilization



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PART 02

Practice and Exploration

Survey and monitoring results support land spatial management

2.1 AI-Powered Precise Farmland Survey



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Method & workflow

Data collection
and processing

Farmland data

Meteorological
data

Crop parameters

Soil data

Estimation of grain
production potential

Agricultural climate
index

Light + temperature

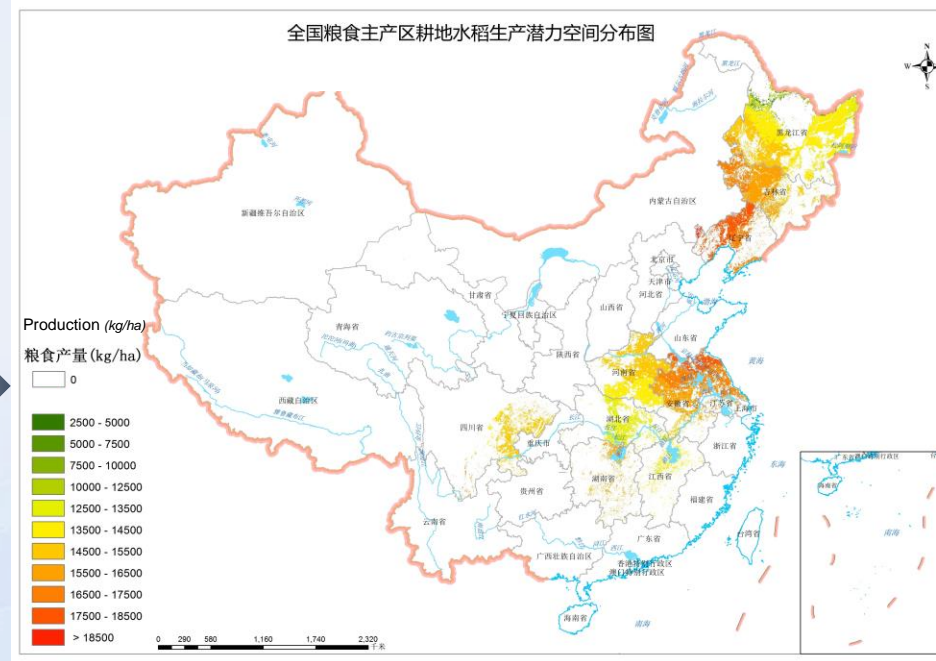
Light + temperature
+ water

Light + temperature
+ water + soil

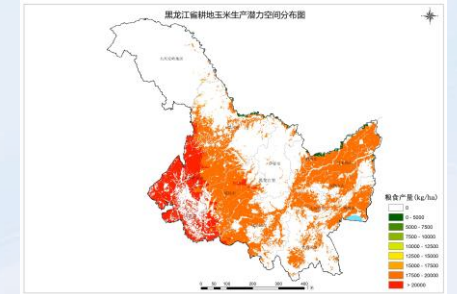
Farmland
class II

Calculation results

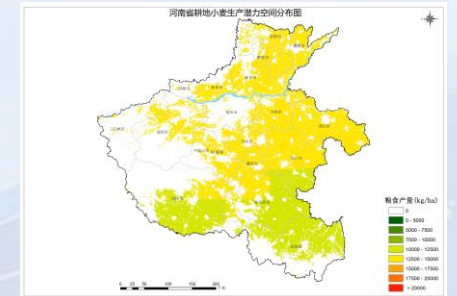
Paddy rice



Corn



Wheat



Spatial distribution map of production potential in major grain producing areas of China



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2.1 AI-Powered Precise Farmland Survey



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Support food security and sustainable utilization



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2.1 AI-Powered Precise Farmland Survey



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2.2 Scientific Delimitation of ERLs



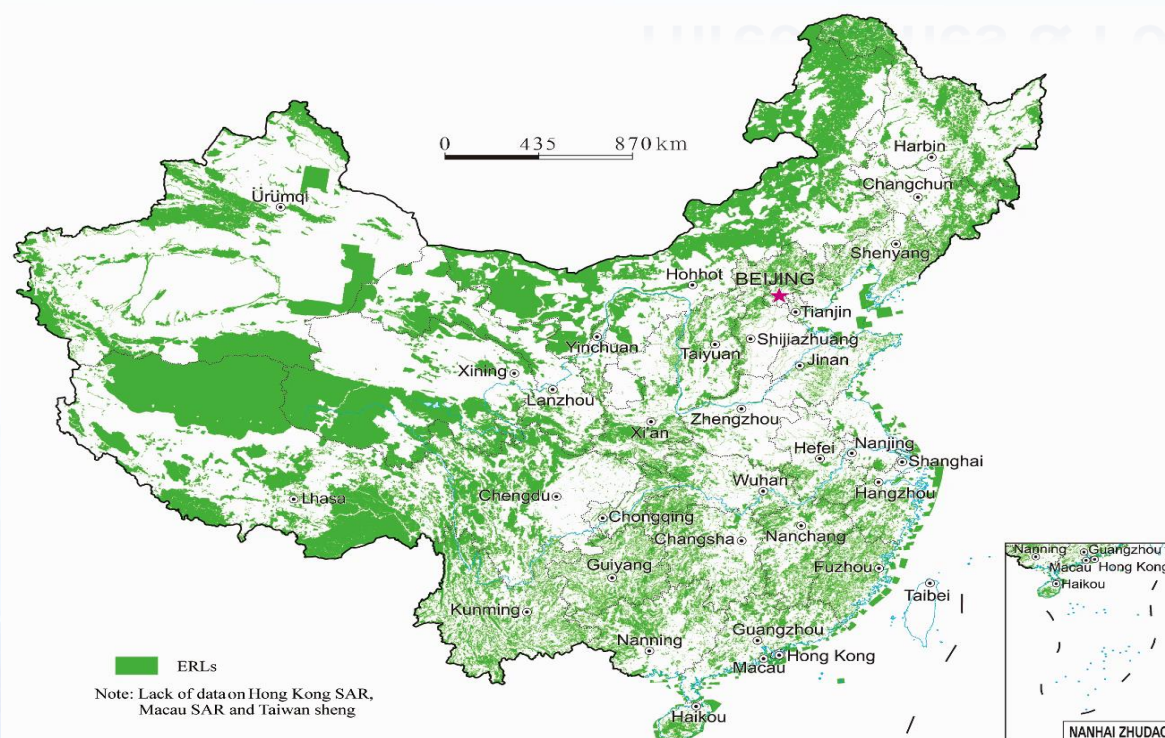
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01

New requirements for digital governance in the construction of ecological civilization.

Three Zones & Four Belts



生态保护红线

319

Ecological Red Lines

Land 304

Marine 15



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02 Integrated “Space-Air-Ground-Net” Digital Survey & Monitoring System.



2.3 City Examination for Spatial Planning



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01 The index of economical and intensive utilization increased by 3.4%.



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2.3 City Examination for Spatial Planning



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02 Urban land use space structure and function optimization.



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PART 03

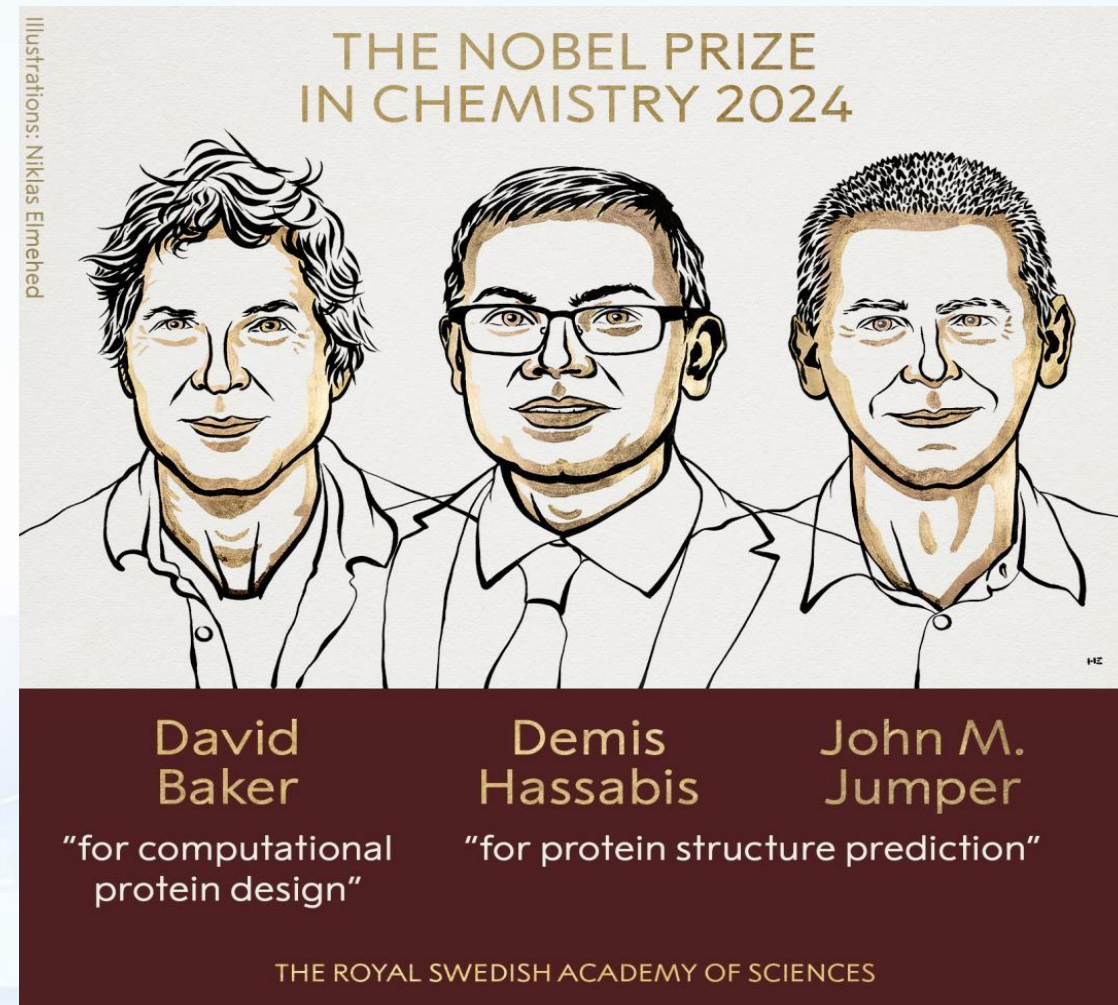
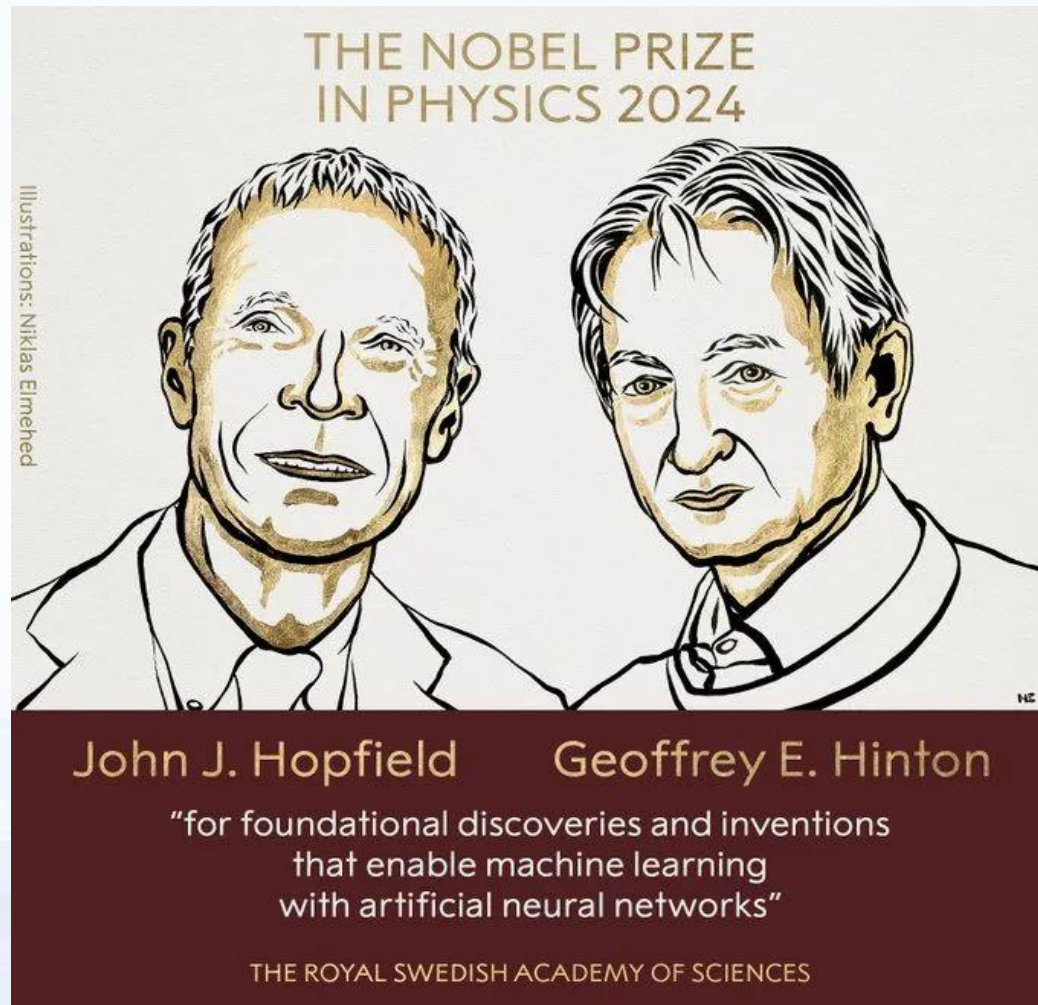
Opportunities and Challenges

Survey and monitoring to support land spatial management in the new era

Who is the biggest winner of Nobel Prize?



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3.1 Opportunities

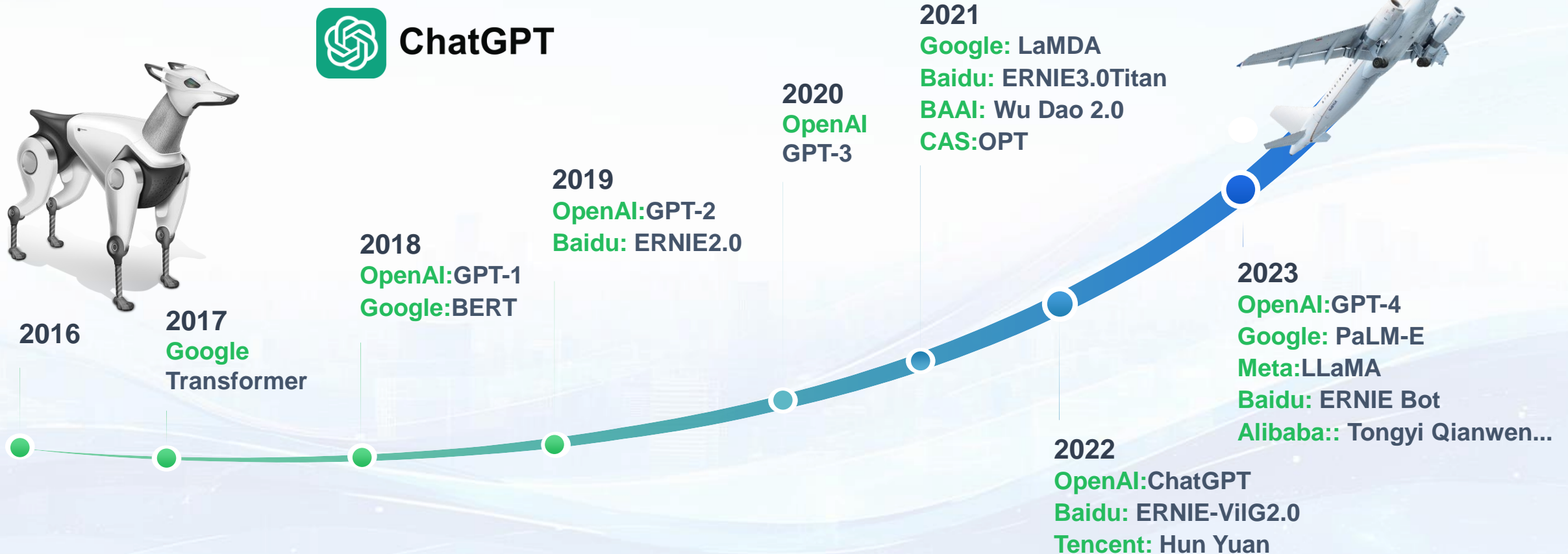


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01

Rapid advancement of intelligent technology



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3.1 Opportunities



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02 A Platform for Cross-disciplinary Integration



Win-win

Creation

Cooperation

Share



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3.2 Challenges



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01 How to enhance the resilience of national spatial security in the face of extreme shocks?



Global Climate Governance



Biodiversity Conservation



Extreme Disasters



3.2 Challenges



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02

How to help promote high-quality and green development of national land and space in the face of new challenges such as population shrinkage and energy revolution?



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3.3 Challenges



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03

How to improve the digitalization level of spatial governance in the face of the transformation of high-tech such as artificial intelligence?



Cloud compute

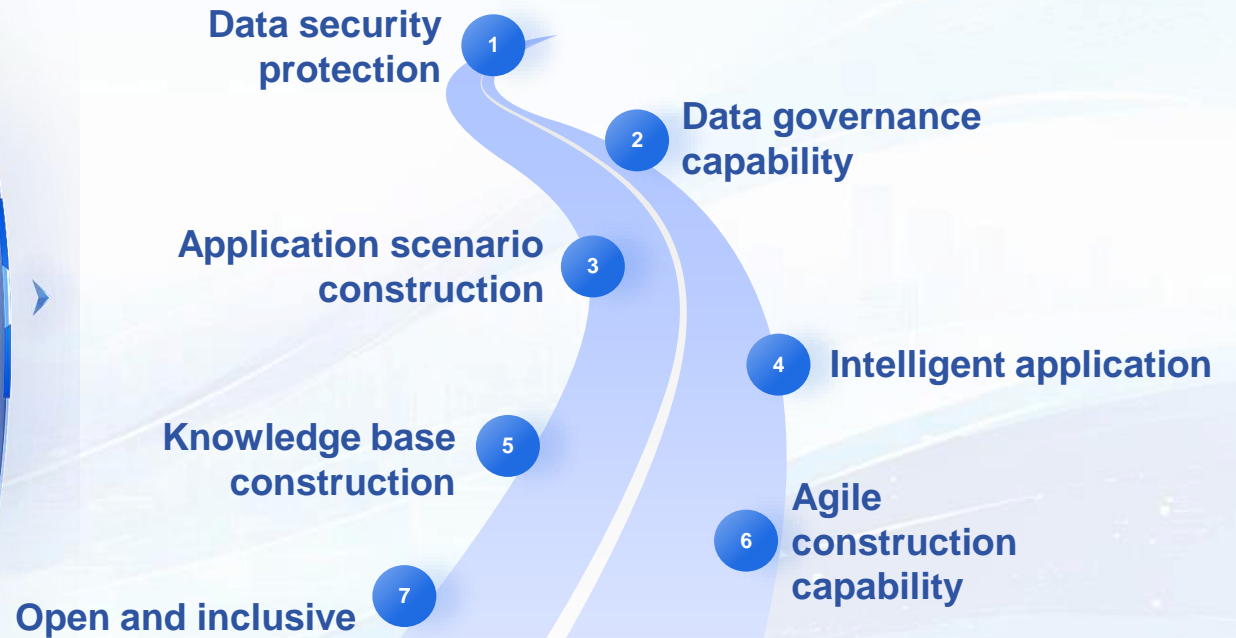
Big data



Data Security

Artificial intelligence

Ubiquitous-Integrated-Intelligent



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3.2 Challenges



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Increasing the application of AI-powered survey

Intelligent recognition of photographic evidence
for agricultural land use in facilities



Online verification assisted by computer vision
model



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Geospatial Ideas Benefiting Our World



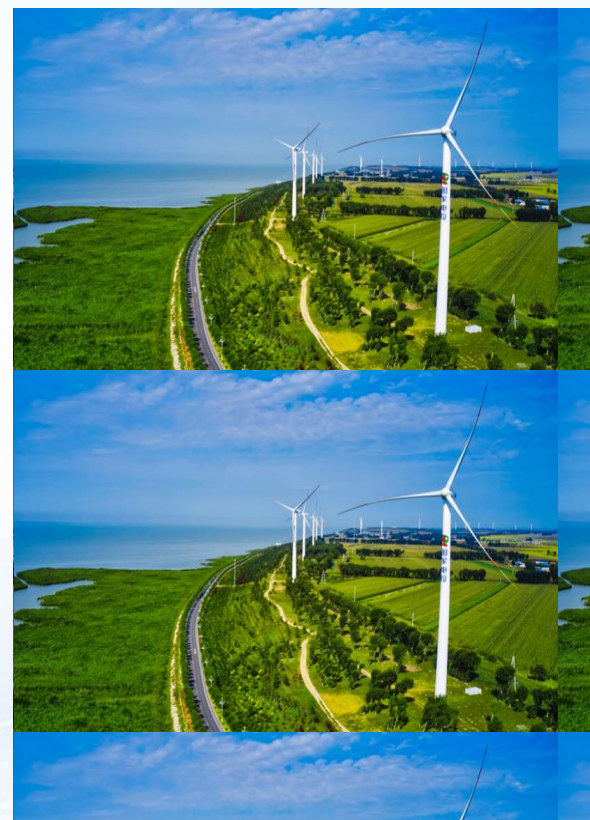
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Bottom line protection



Pattern optimization



Green and low-carbon



Rights protection



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Beautiful Earth

Let's join hands together.

