BeiDou/GNSS-based Agricultural Machinery Navigation and Big Data Application

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1. Hot Applications

The development of smart agriculture and intelligent machinery needs BeiDou. BeiDou has been widely used in the agricultural field, promoting the upgrading of agricultural machinery and the process of agricultural modernization.

Automatic steering
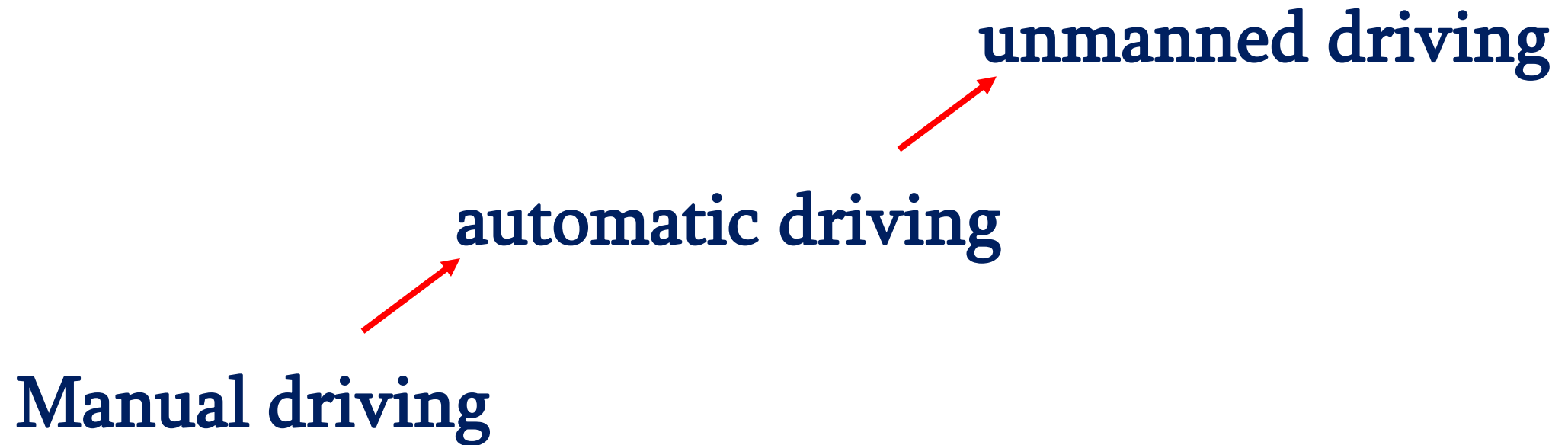

Operation monitoring

Remote maintenance

UAV plant protection

Marine fishery

unmanned driving

automatic driving

Manual driving

Skilled operator: ±10 cm

Operating accuracy： ±2.5 cm
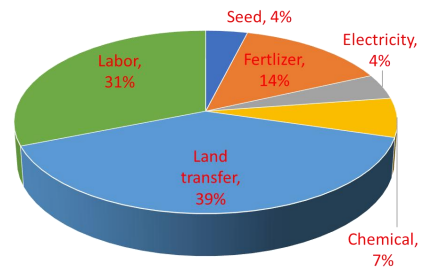
- Accuracy：±2.5cm

- Improve land use：1%~2.5%

- Expand working time

- Relief labor intensity

- Reduce labor cost：1/2~2/3

Installed terminals: ≥ 200,000 pcs
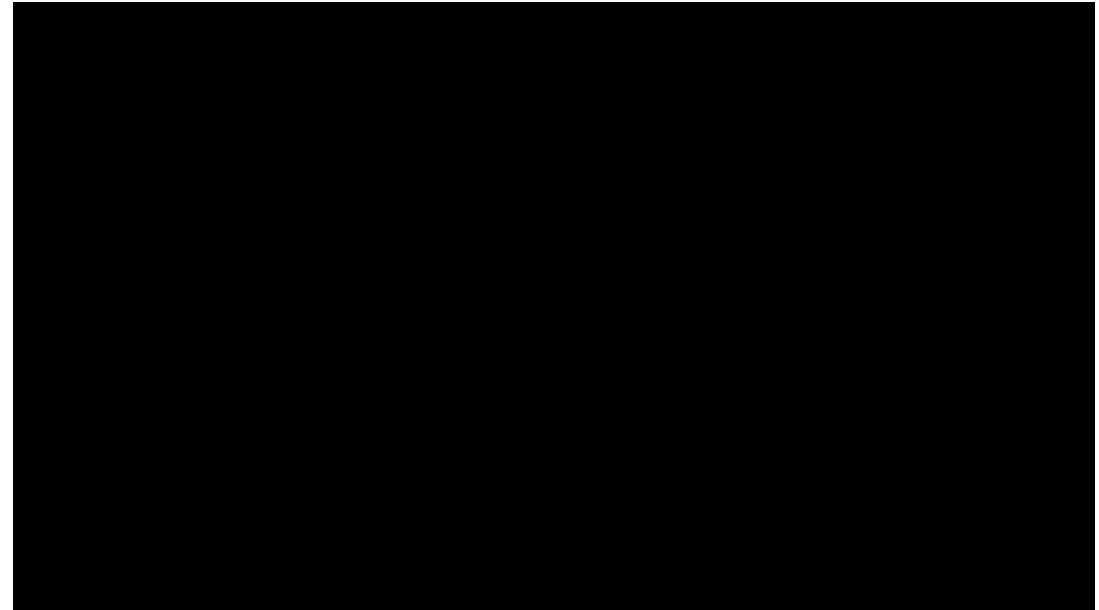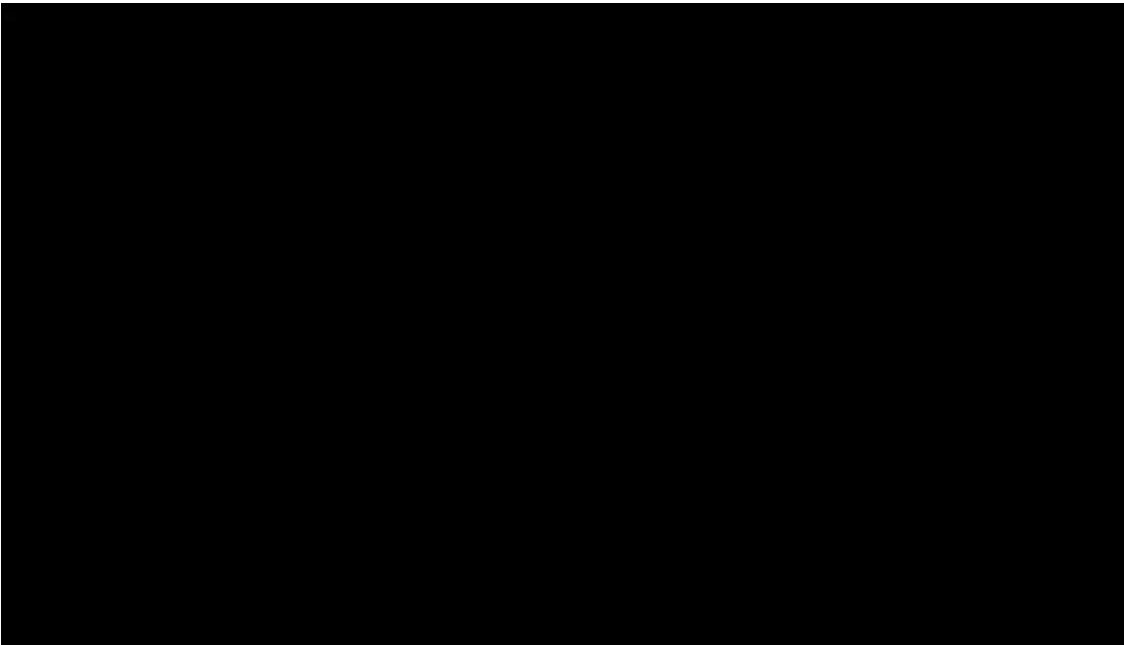
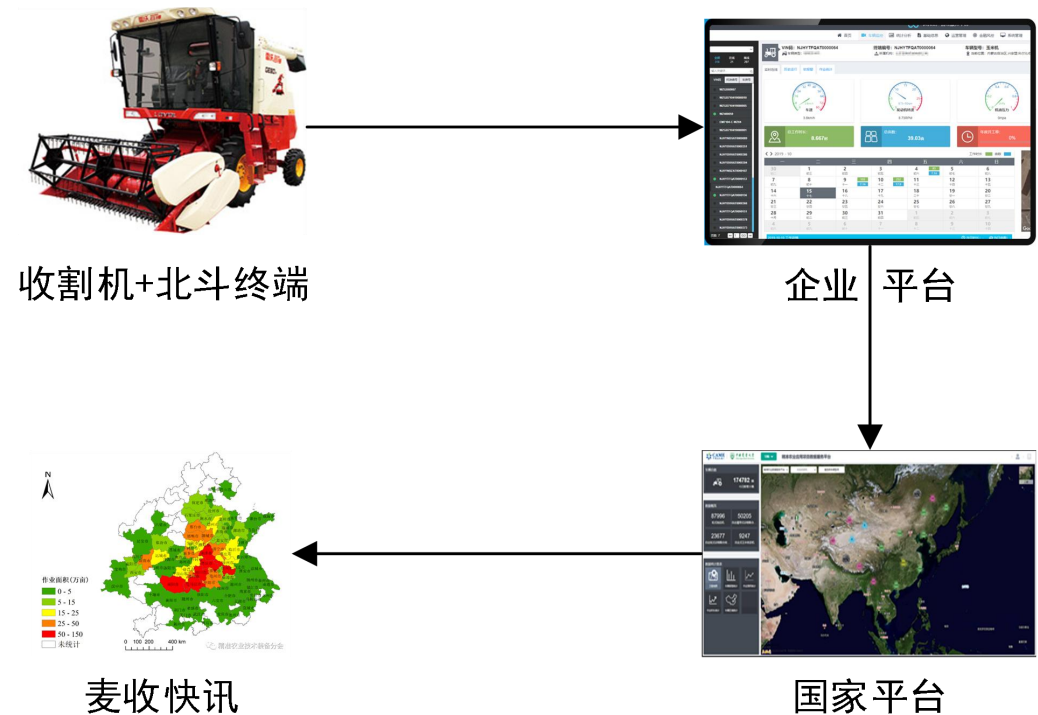Beidou is changing the operation mode of agriculture in China

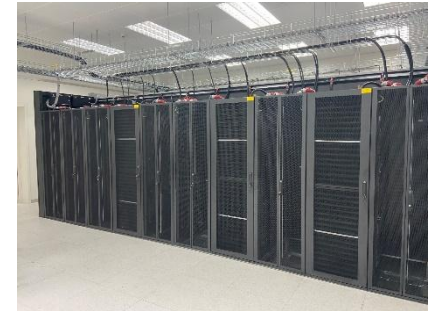To further reduce labor force and improve automation, to realize the transformation from human to machine.

New standard：vehicle，machinery，field……

3. Big Data Application

- **China Agricultural University has accessed 530,000 BeiDou terminals from various manufacturers to form big data for agricultural machinery operation.**

- **In the summer of 2021 and 2022, 61 issues of "*Wheat Harvesting Newsletter*" were produced and released in combination with wheat harvesting.**
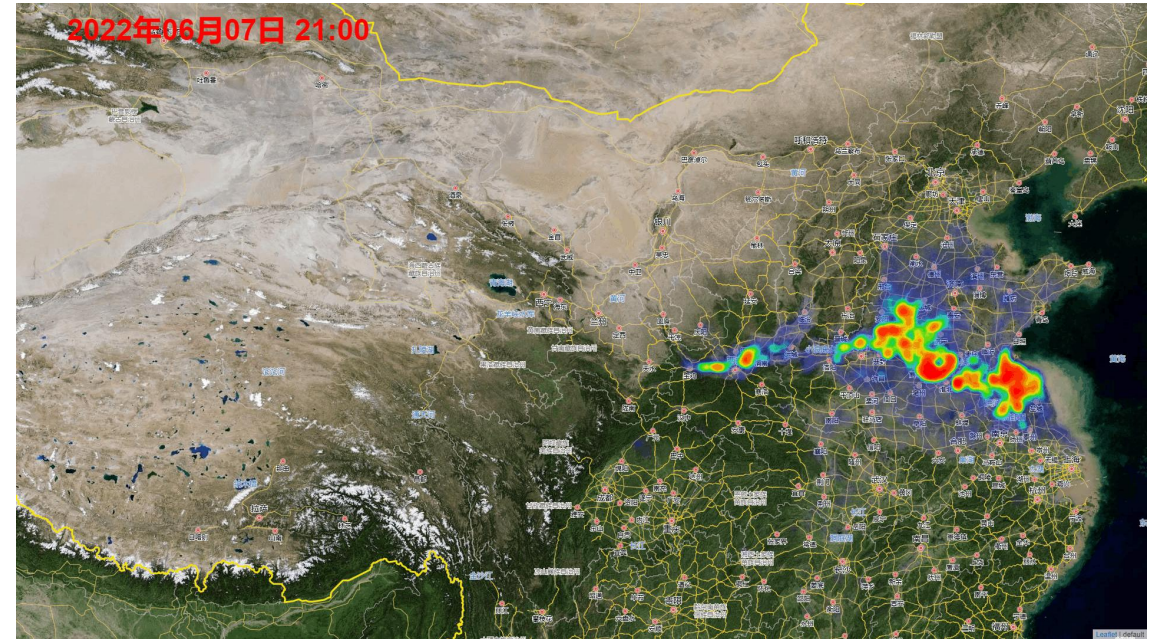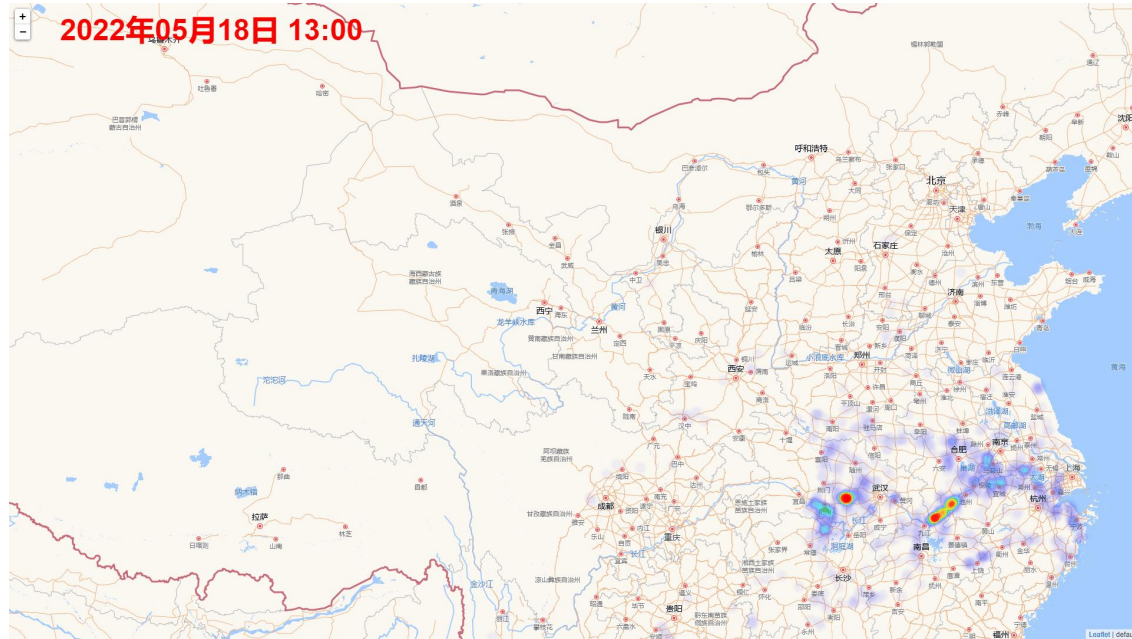
收割机+北斗终端

企业 平台

麦收快讯

国家平台

3. Big Data

In June, the wheat combines work from south to north for one month.

2022年05月18日 13:00

2022年06月07日 21:00

Operation duration
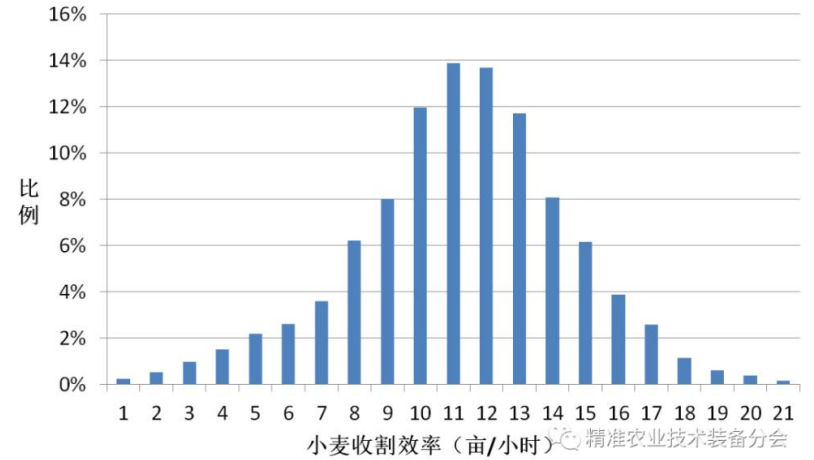
Operation area
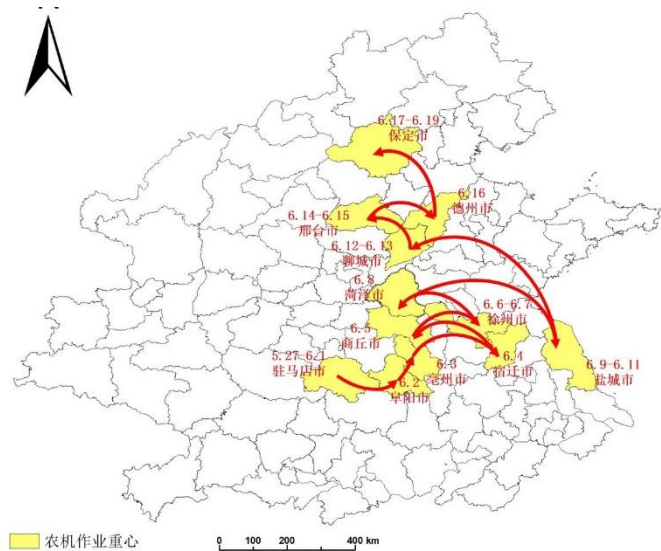
Hot regions

Harvested area

The Ministry of Agriculture and Rural Affairs and CCTV-17 release hot maps and operation statistics data every day.

Big data is not only a valuable data resource, but also a new paradigm of scientific research. Big data is changing the operation, organization, and management of agricultural machinery.

To master the wheat harvest progress

To arrange harvesting operations scientifically

To allocate parts and maintenance resources around harvest hot spots

By 2021, China has more than **120,000** UAVs for plant protection, with an operation area of more than **71.3 million ha**, and more than **200,000** pilots. The ruling effect of aviation plant protection unified prevention is **10%~20%** higher than that of farmers' self prevention. The use of pesticides is reduced by **20%~30%,** and the utilization rate of pesticides is increased by more than **10%**.

5. Marine Fisheries Usage

➢**China is a big fishing country**
- – Maritime area：3 million sq km
- – Marine fishing vessels：about 310,000
- – Fisherman：8 million

➢**Fishery production is a high-risk industry**
- – Lack of effective tools of communication
- – Lack of effective means of rescues

➢**BDS for marine fisheries**
- – Positioning
- – Short Message

- Conclusions:
  - BeiDou has been widely used in China's agricultural field.
  - BeiDou improves the quality and efficiency of agricultural machinery operation.
  - BeiDou will promote the realization of smart agriculture and intelligent machine, helping to ensure global food security.

- Proposes:
  - To carry out international cooperation in talent training about GNSS and smart agriculture.
  - To carry out precision agriculture technology demonstration to ensure food safety.
  - To plan and apply international cooperation projects between governments.
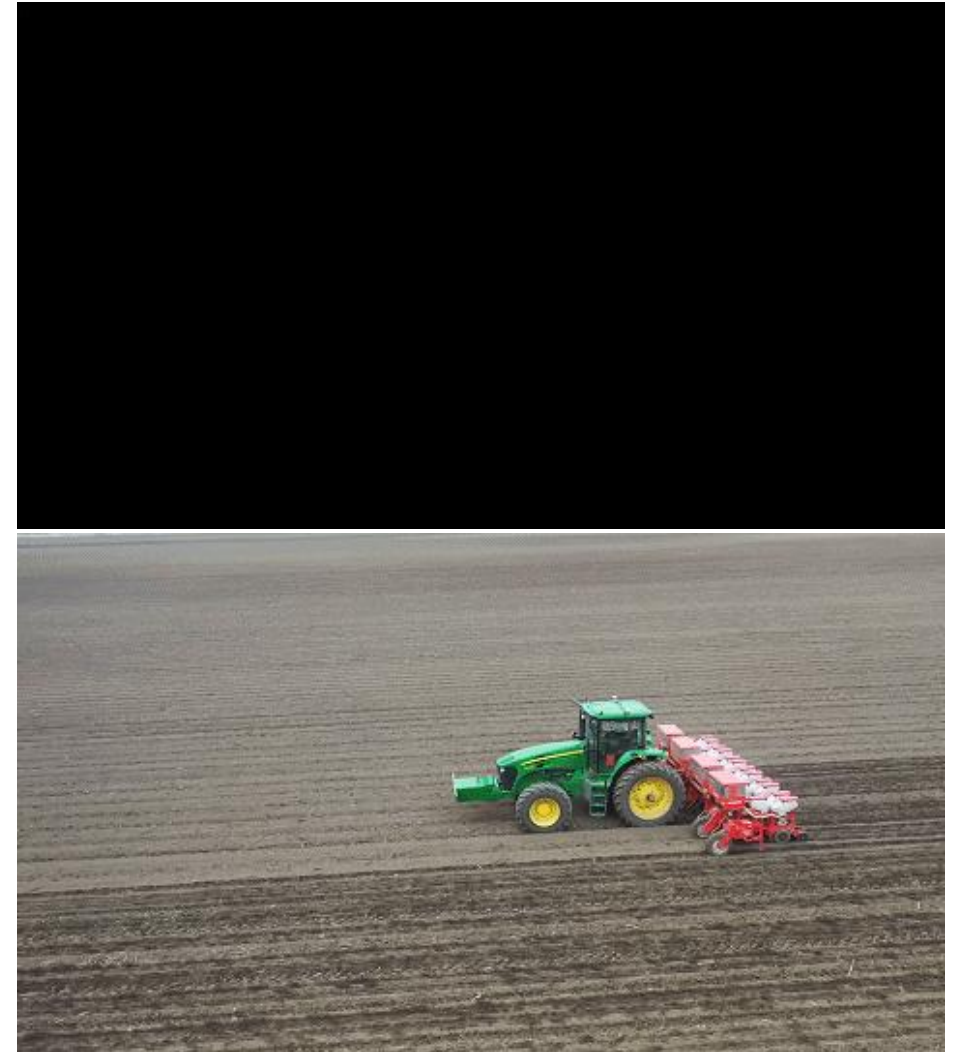
Thank you for listening !

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