# Horticulture 4.0 Conference

## Professor Simon Pearson
## University of Lincoln

West Sussex Growers' Association

Supported by NatWest

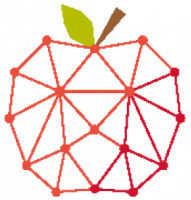
Media Partner HorticultureWeek

University of Chichester

# Agri-Robotics and the Digital Transformation of Agriculture

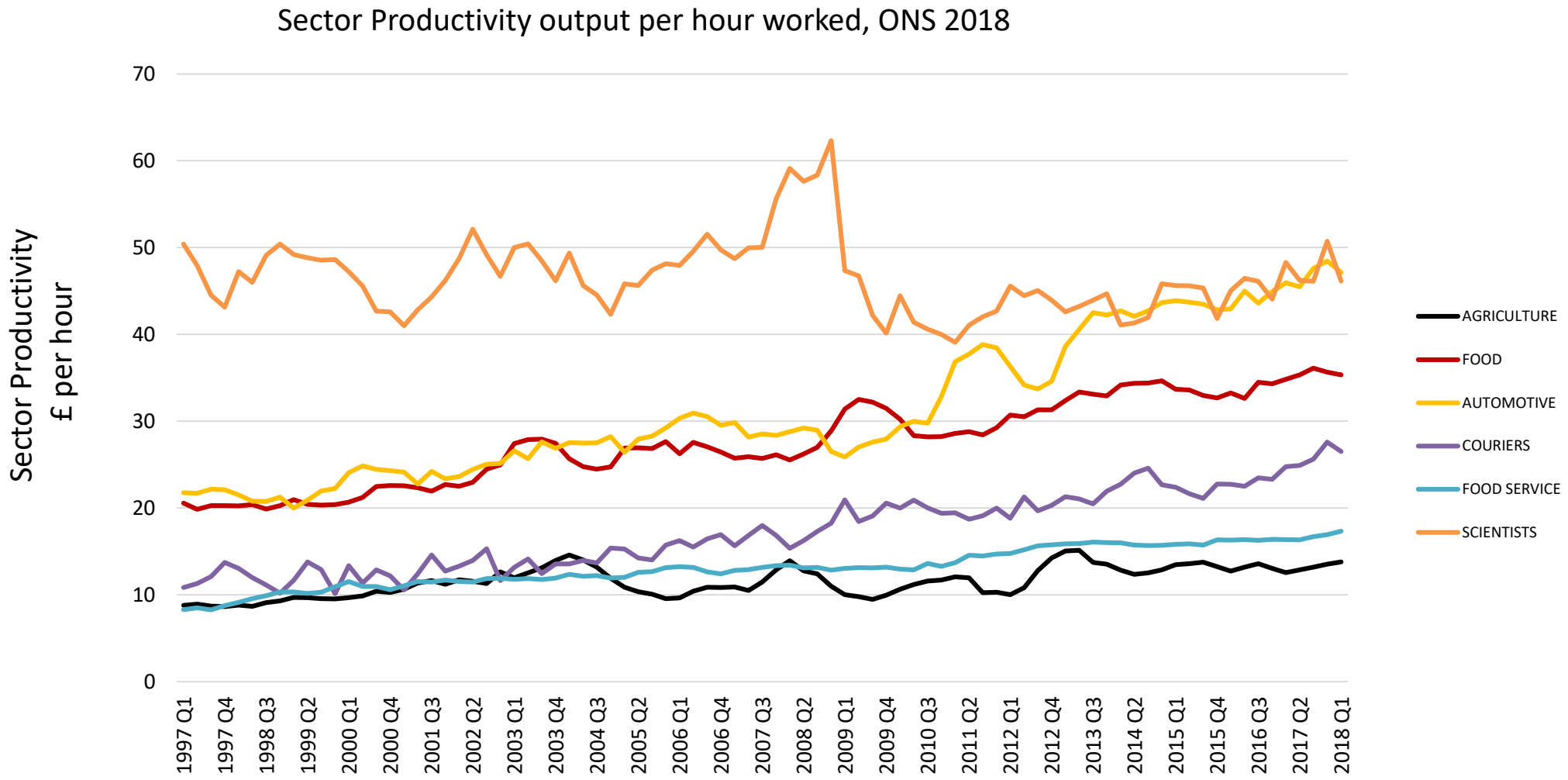
Professor Simon Pearson
The University of Lincoln

Internet of Food Things Network Plus

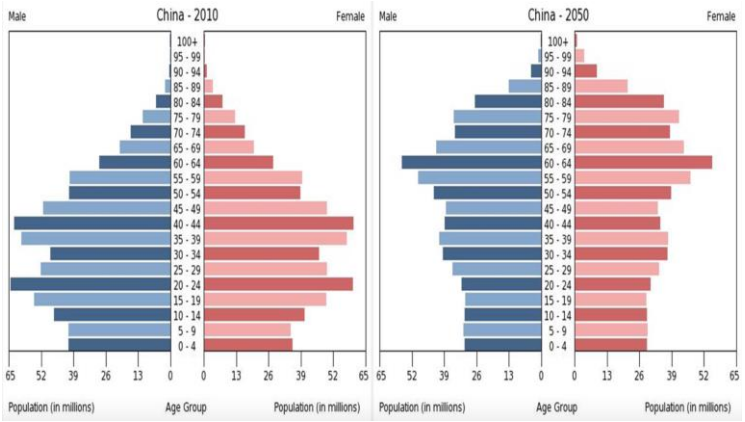


STFC Food Network+

# 1. Reality Check….



# 2. Demographics and politics: Brexit




# 3. Made Smarter Review

**VALUE AT STAKE FOR THE FOOD AND DRINK INDUSTRY IS ESTIMATED TO BE £55.8BN BETWEEN 2017-2027**

| VALUE LEVER DESCRIPTION | VALUE TO INDUSTRY (£ BN) | VALUE TO INDIVIDUALS | VALUE TO SOCIETY |
|---|---|---|---|
| Revenue growth through new revenue streams | £3.2 | • £2,266 saving per household due to improved waste management<br>• 25% increase in product satisfaction related to customisation of products | • 32 million $tCO_2e$ reduction throughout the food supply chain in 2027[1], due to more efficient production processes and reduction of waste. This represents a 29% reduction in overall food emissions in the UK<br>• 17.6 mn tonnes of food waste reduced over the next decade<br>• An estimated 27,370 injuries avoided over the next decade from implementation of digital technologies<br>• Potential to reduce the number of food poisoning cases by up to 4.5m through better traceability in the supply chain and monitoring of shelf life |
| Cost reduction through digitally enabled R&D | £0.5 | | |
| Cost reduction through digitally enabled manufacturing and asset maintenance | £13.2 | | |
| Cost reduction through digitally enabled supply chain management | £1.1 | | |
| Cost reduction through automation of labour | £24.7 | | |
| Cost reduction due to increase in resource efficiency | £13.2 | | |
| **Total value to industry** | £3.2 — £55.8 | | |

1) Reduction of emissions is not presented as a cumulative figure, rather as the reduction saving potential in 2027

# 4. Transformational Technologies

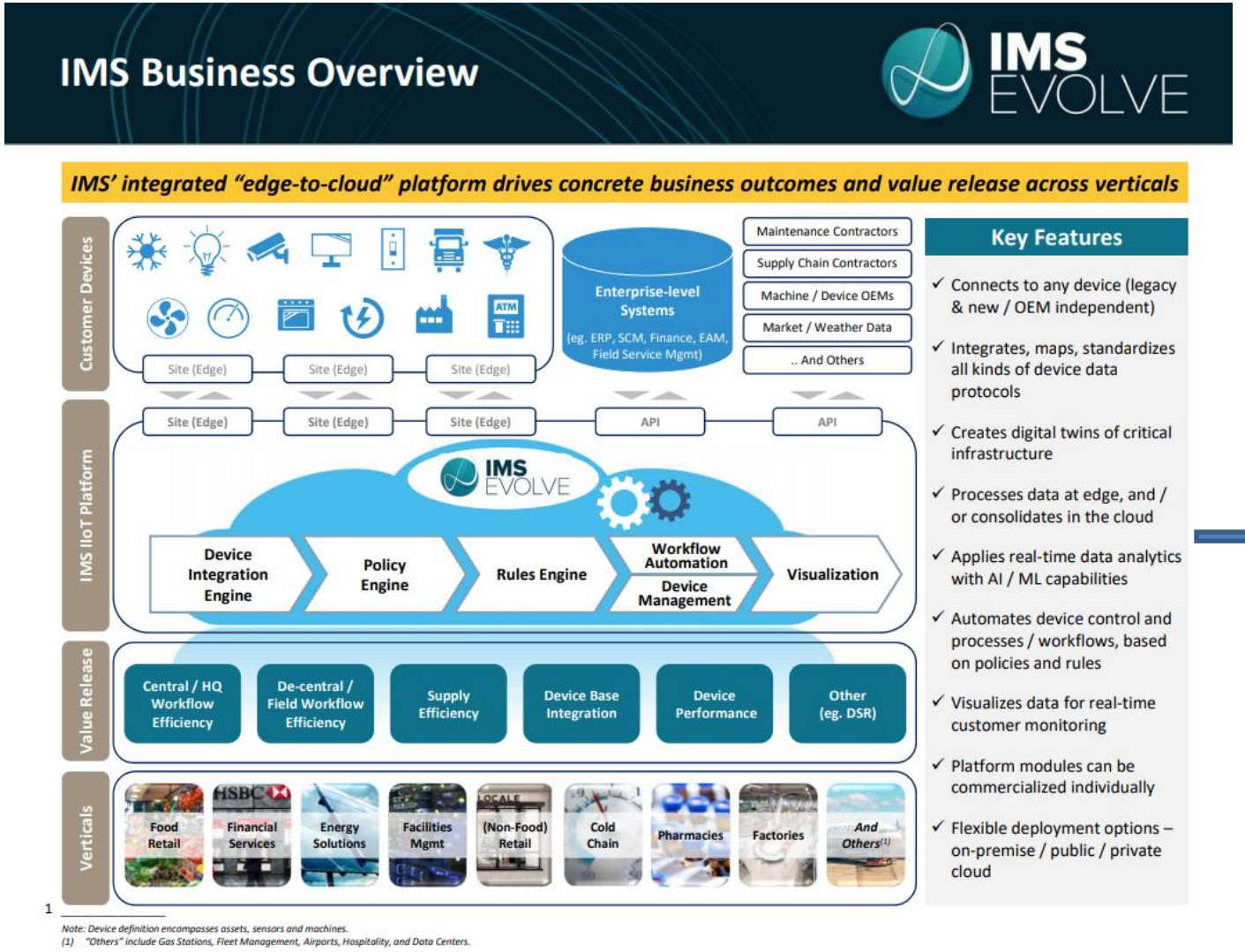
**Easter morning 1900: 5th Ave, New York City. Spot the automobile.**

Source: US National Archives.

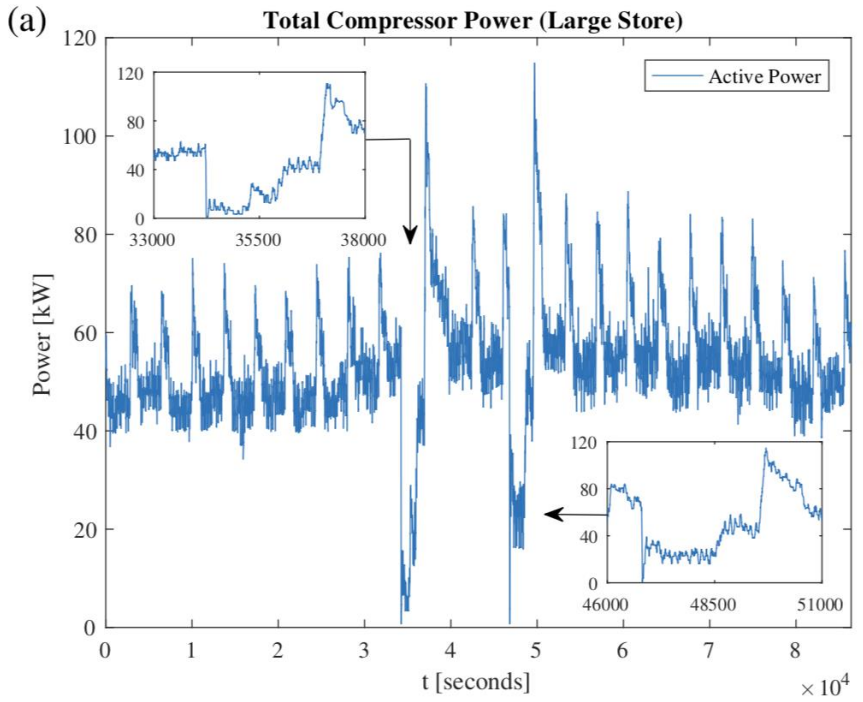
**Easter morning 1913: 5th Ave, New York City. Spot the horse.**


Source: George Grantham Bain Collection.

# 5. Internet of Things Platforms



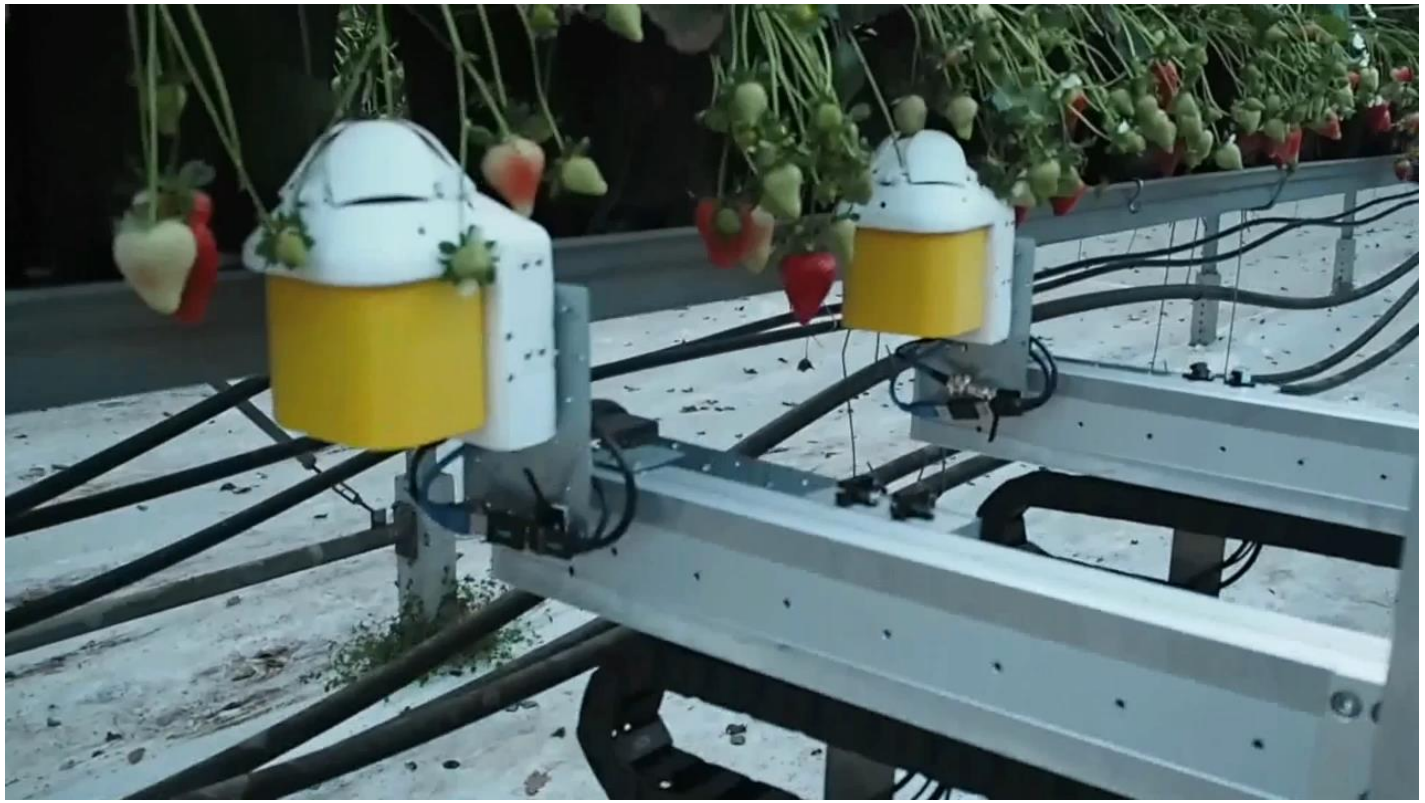

## Food refrigeration and IoT



# 6. Robotics

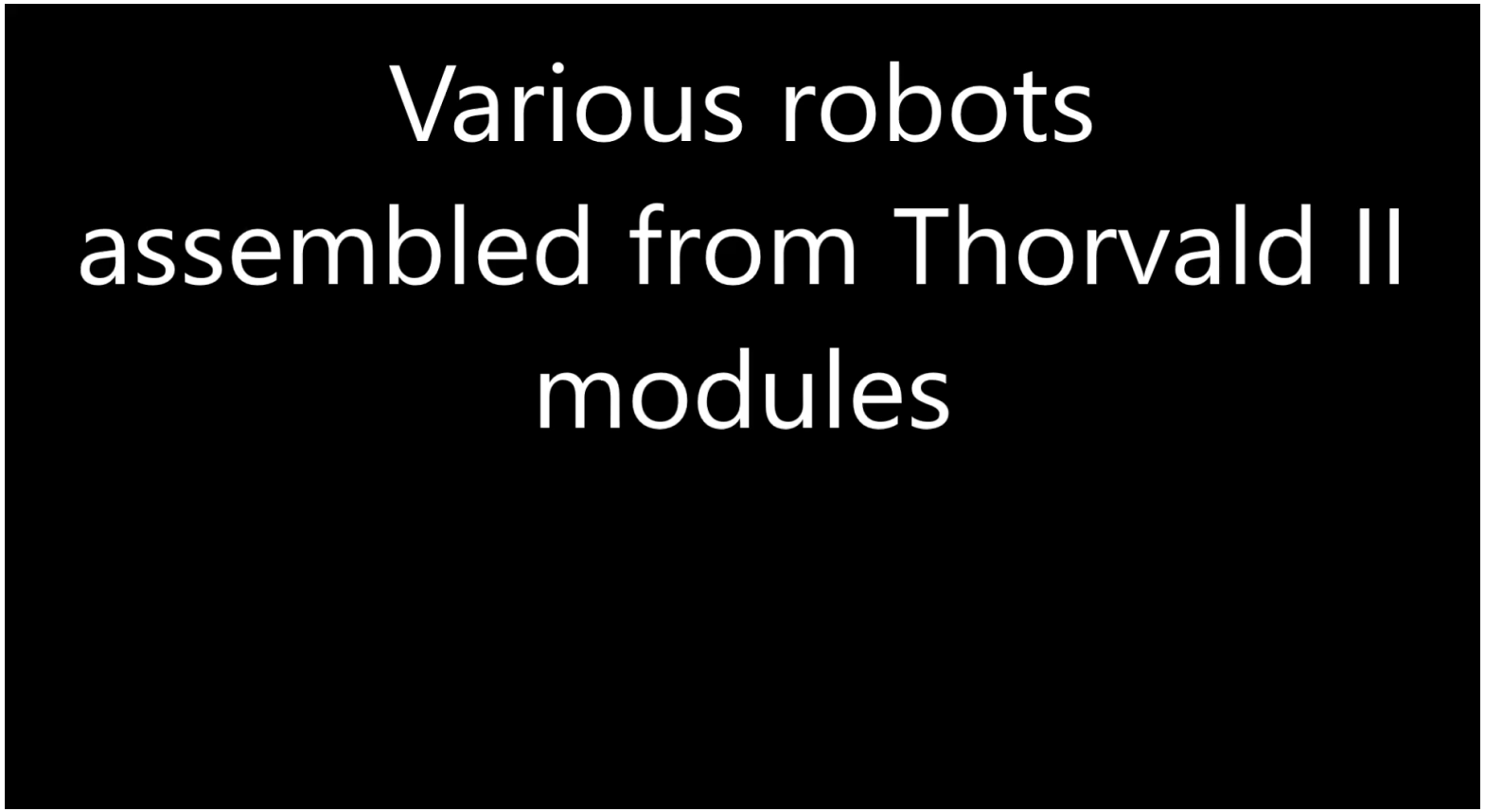
**It is not easy….2 years ago in Japan**

# 6. Robotics



**But progress is being made….**

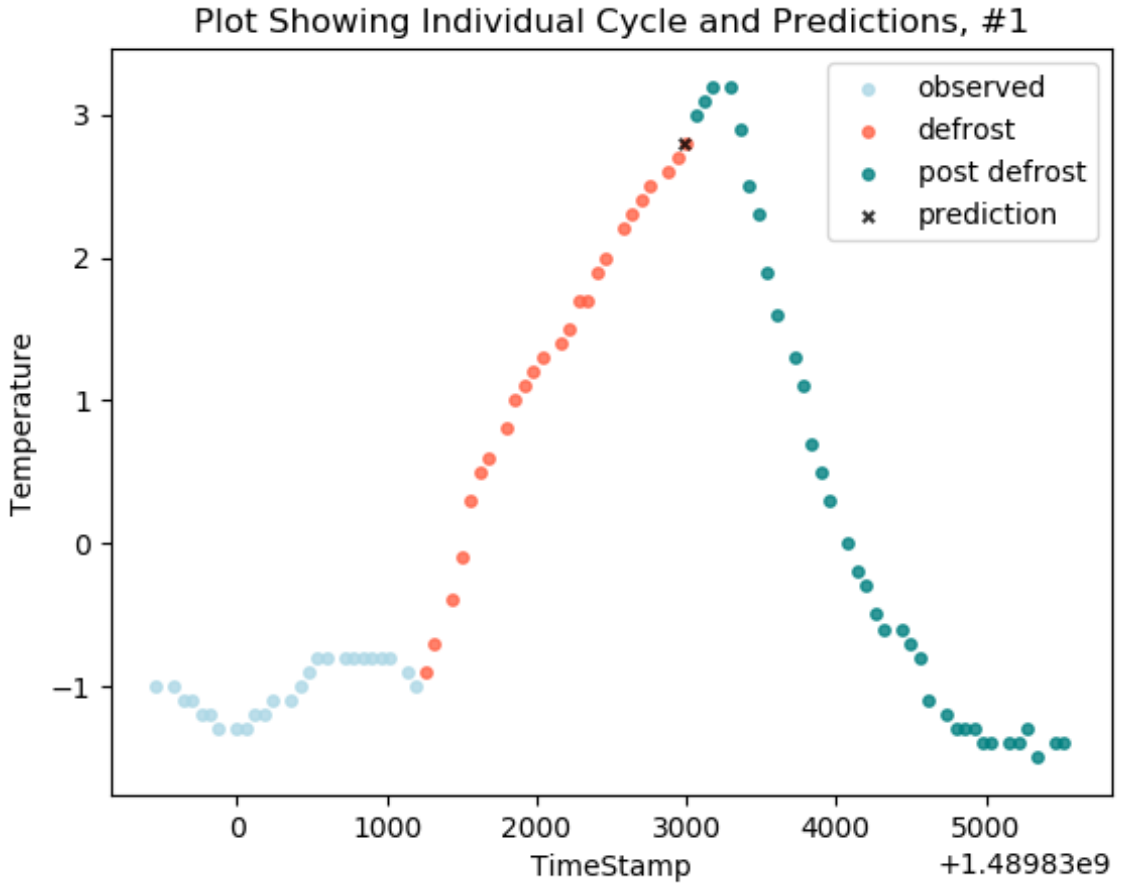
# 6. Robotics



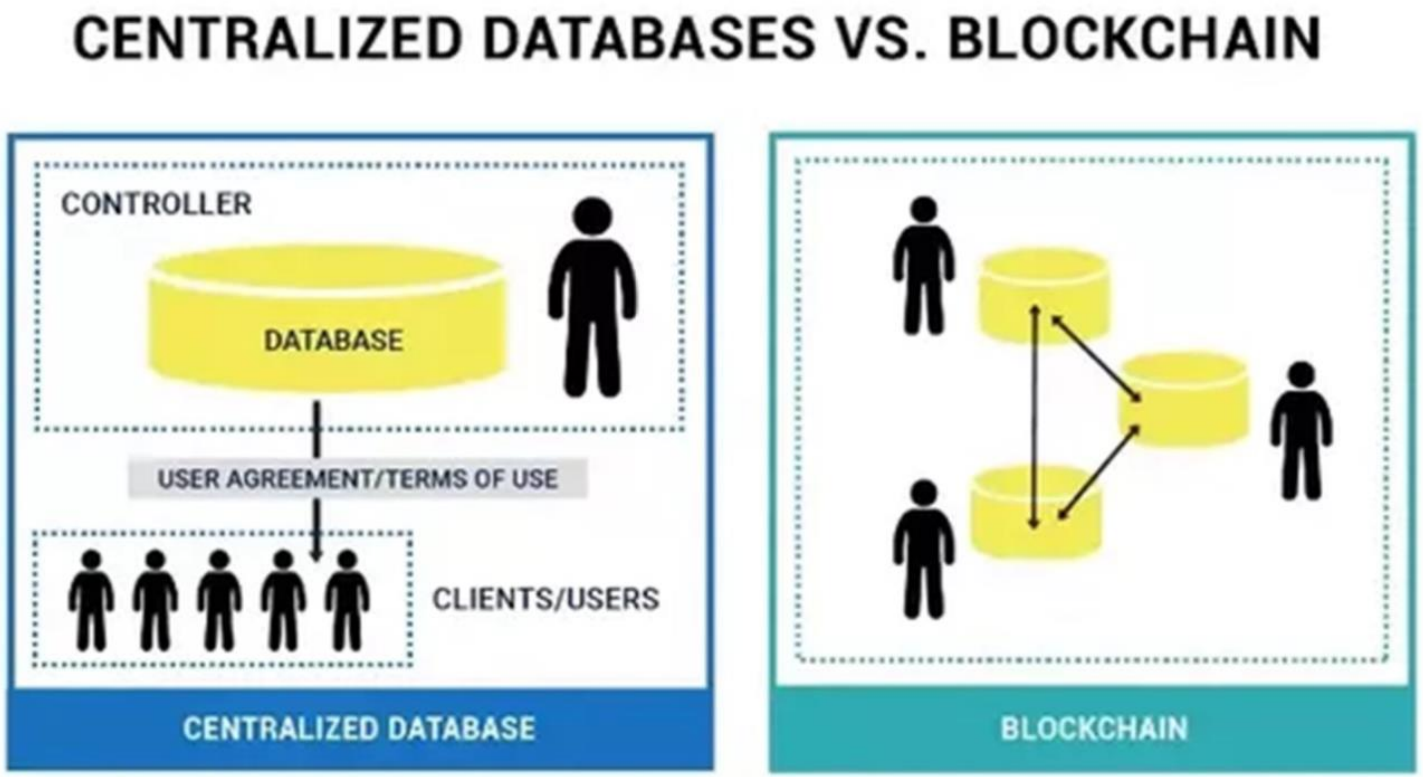
# 7. Artificial Intelligence

Spot the locust….Deep Learning now as accurate as humans

# 7. Artificial Intelligence: Machine Performance



# 8. Blockchain




- Assume 68m consumers
- 5 pieces of food per day
- 85GB data per day
- 31TB a year per ledger
- Max. compression no meta data
- Scalability an issue
- See it in very high risk, value food chains first
- Traceability opportunity powerful, but pragmatic approach needed
- Data standards first

The panacea for food safety……?

Food is digitising…
To keep in touch….
please join…….

**Internet of Food Things**
Network Plus