

# Star Wars and Star Trek: Technology in the Farm of the Future





**Do Different**

# Our Mission



SASKATCHEWAN



MANITOBA

Established: 1975




## *Mission Statement:*

To enhance sustainability and profitability in agriculture and other sectors through research, innovation, adaptation and knowledge transfer.


# Corporate Organization Chart




Joanne Forer,  
VP Corporate Services



Dave Gullacher, P.Eng  
President and CEO



David Yee, B.I.D.  
VP SK Operations



Harvey Chorney, P.Eng  
VP MB Operations

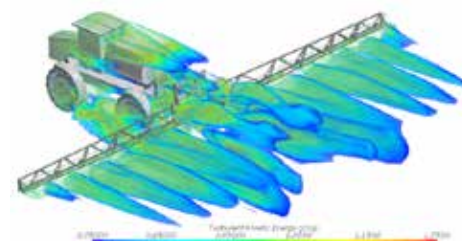


OTTAWA



Have you ever wanted to...



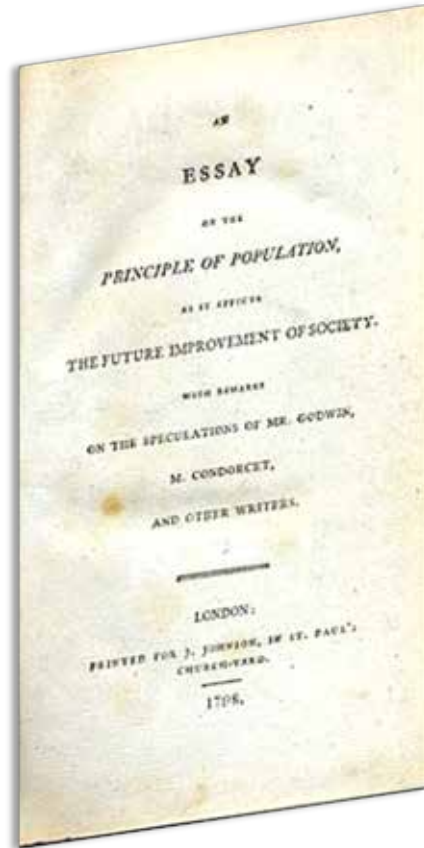


# Agriculture 4.0

- Precision AG
- Precision Farming
- Digital Farming
- Digital AG
- “Techgonomy”



# ***Malthusian Spectre***



**"The power  
of  
population  
is  
indefinitely  
greater than  
the power in  
the earth to  
produce  
subsistence  
for man"**



# Resolution



10,000 foot



Plantings



Leaf



Field



## Variable Resolution



**Field**



**Plant/Leaf**



**10,000 foot**

## What Is the Purpose?

- Manage Risk



- Reduce Costs



- Informed decisions



- More productivity  
from current  
resources



- Right Source
- Right Place
- Right Time
- Right amount

## The Systems/Functions



Machine Vision



Big Data Stream



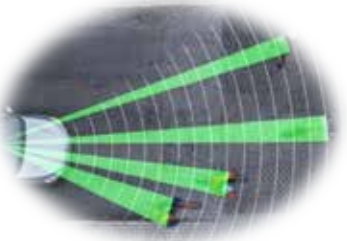
Machine Learning



Database



Predictive Analytics/AI



Sensor



# What the systems actually are

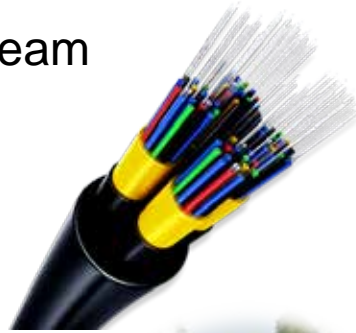


Machine Vision



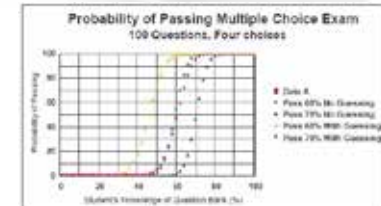
Collision Avoidar  
LIDAR unit

Big Data Stream



Database

Machine Learning



Predictive Analytics/AI

# Sensors

Speed

Temperature

Nutrient Load

Moisture

Displacement

Carbon Monoxide

Distance Travelled

Barometric Pressure

Pressure

Proximity

Sodium

Blood Pressure

Light Colour

Irradiance

Estrus

Humidity

Torque

Flow

Glucose

Air Quality

Electrical Conductivity

Inclinometer

Bend

Wearables

Vibration

Fuel  
Consumption

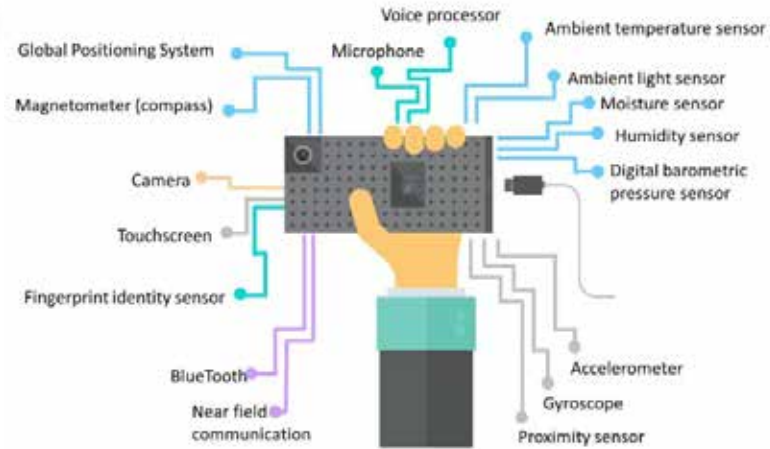
Gyroscope

Position

Heartbeat



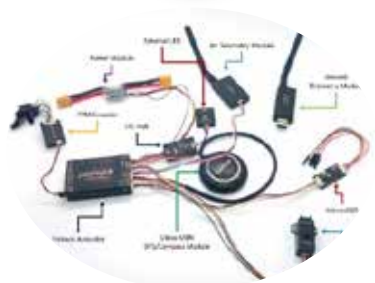
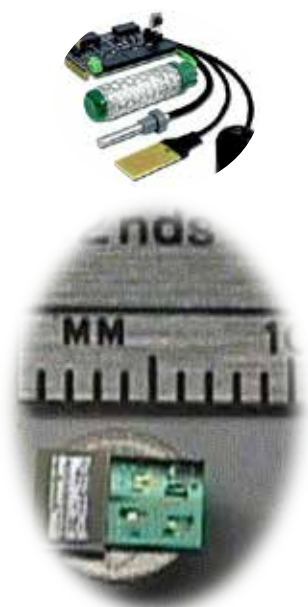
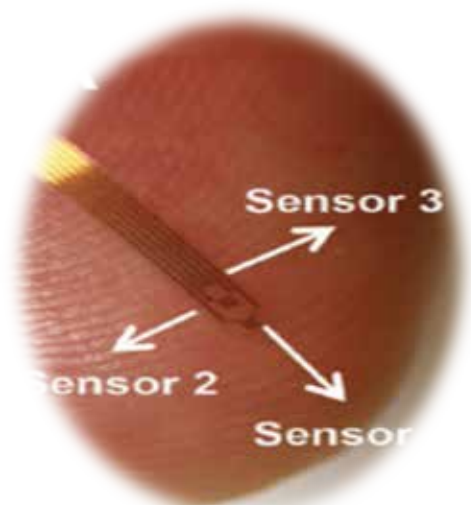
# In everyday life



## What's in the Adidas **micoach**?

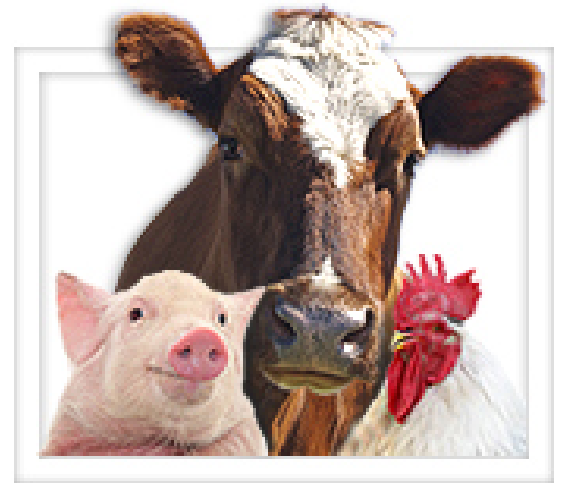


# Smart Dust/Sensor Motes

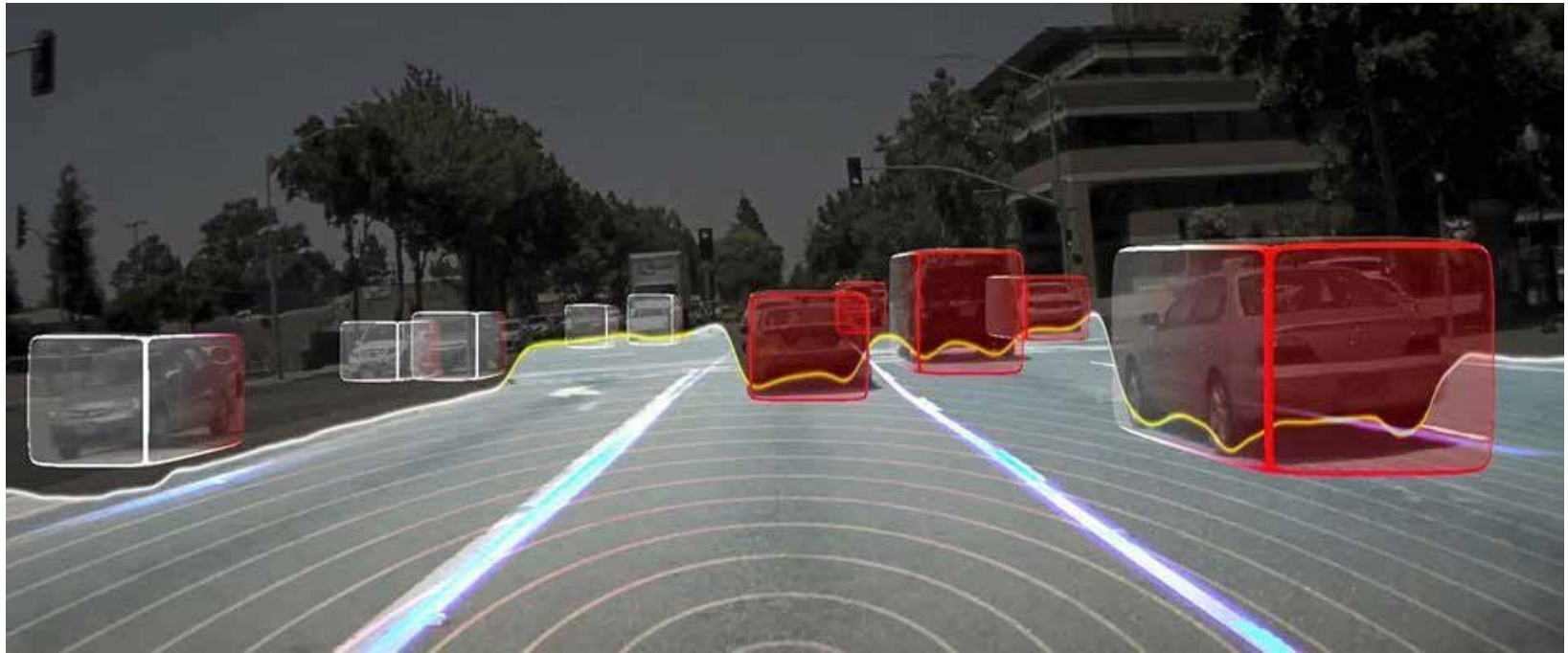




## Mules for sensors



## How Nvidia's BB8's AI sees the world



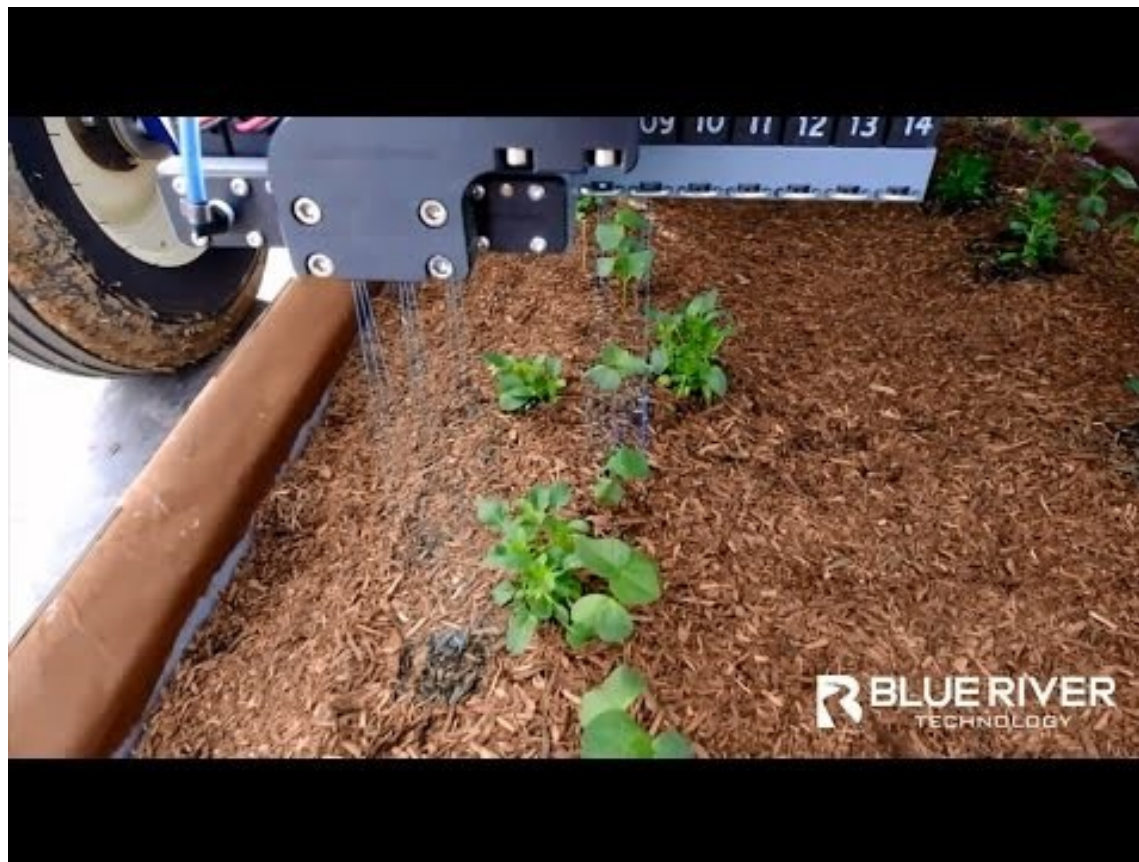


ROCKSTAR Games





# Variable Rate Spray Technologies



# Variable Rate Spray Technologies

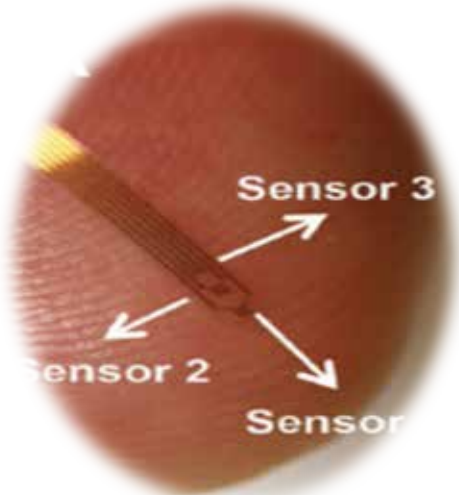


# Integrated Pest Mgmt



- Degree day Modelling
- Dynamic Phenology
- Utilizing stitched data models from surrounding land and crops.
- Advanced forecasting of degree day rising: 1-2 wks to 1 month.
- Site specific

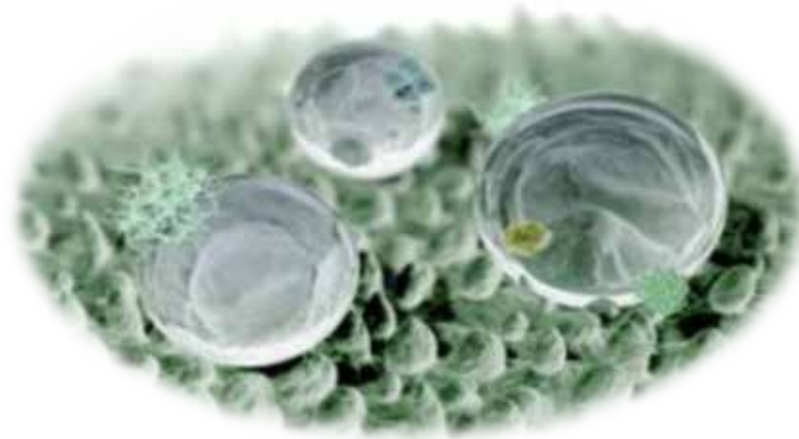
Microfluidics





## Nanotechnology/ Quantum Dots

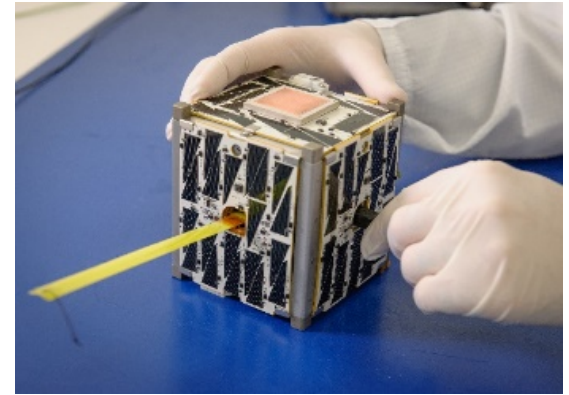
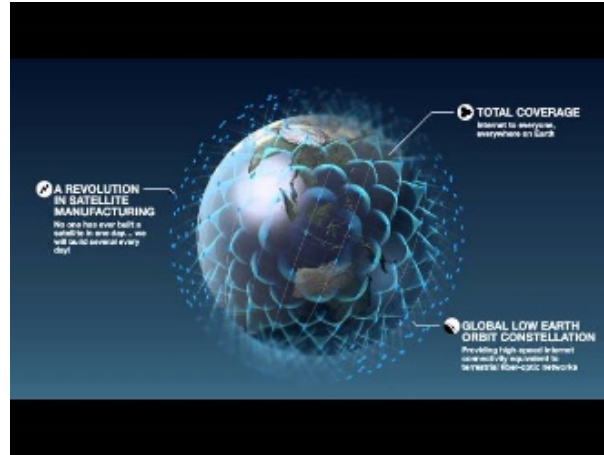
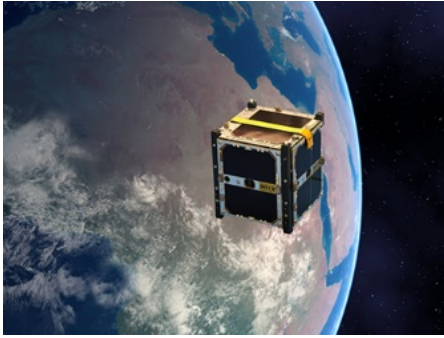
### Fertilizers/Fungicides/Pesticides /Feed/Immunology



- Targeted Delivery
  - Biosensor (Aptamer) enabled.
  - Smart release triggered by exudates in Canola.
  - A smarter tracer. Tracking nutrient flow with Quantum dots in organic compounds.
- A new way to study the black box of soil, and organic movement within the box.

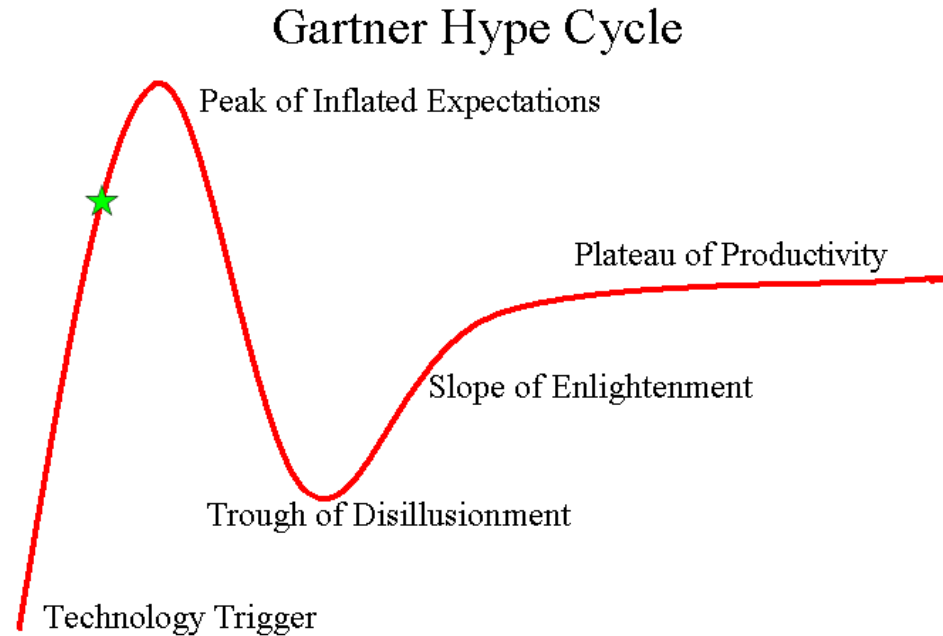


# Near field Satellite Web

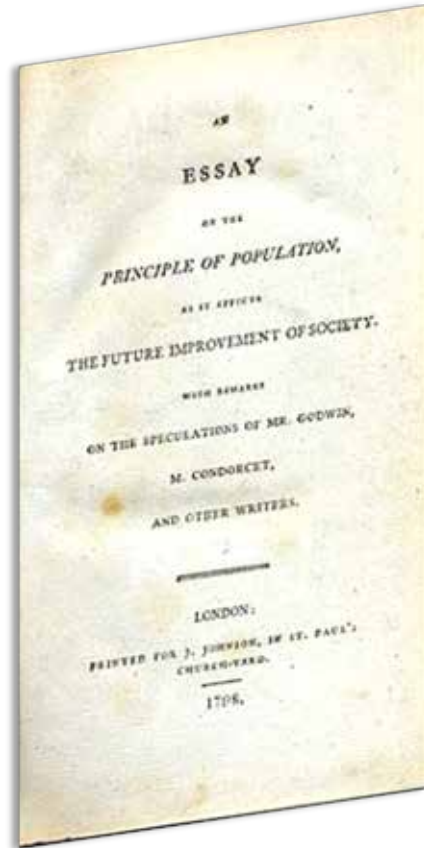


## What does this all mean?

- Timely information.
- High resolution.
- High traceability.
- Finer control.
- Be engaged.
- The most important asset on the farm is .....



## *Malthusian Spectre*



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of  
population  
is  
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subsistence  
for man"**





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PAMI VP Ops

THANK  
YOU



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# Questions?

