

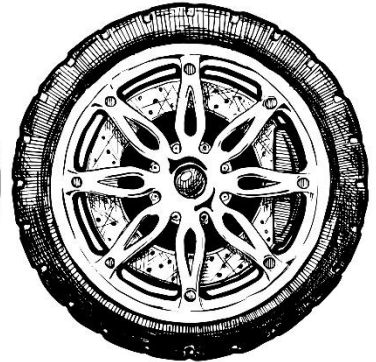
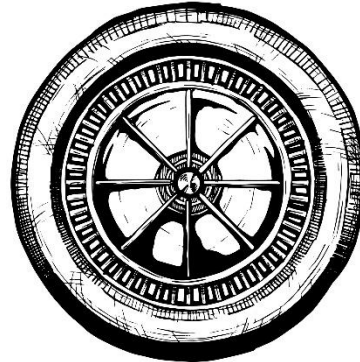
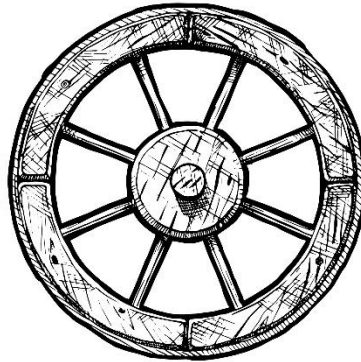
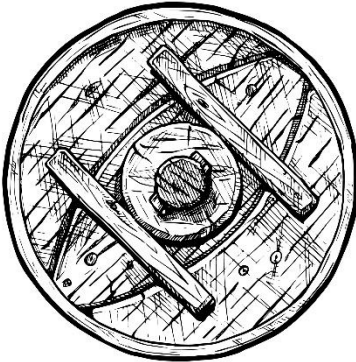
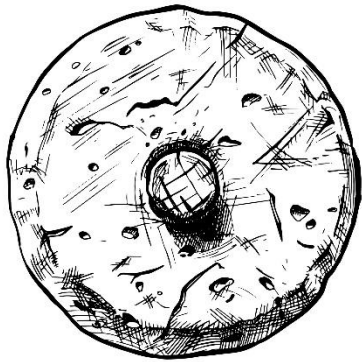
CGA Citrus Summit
14 March 2019

Jacomien de Klerk

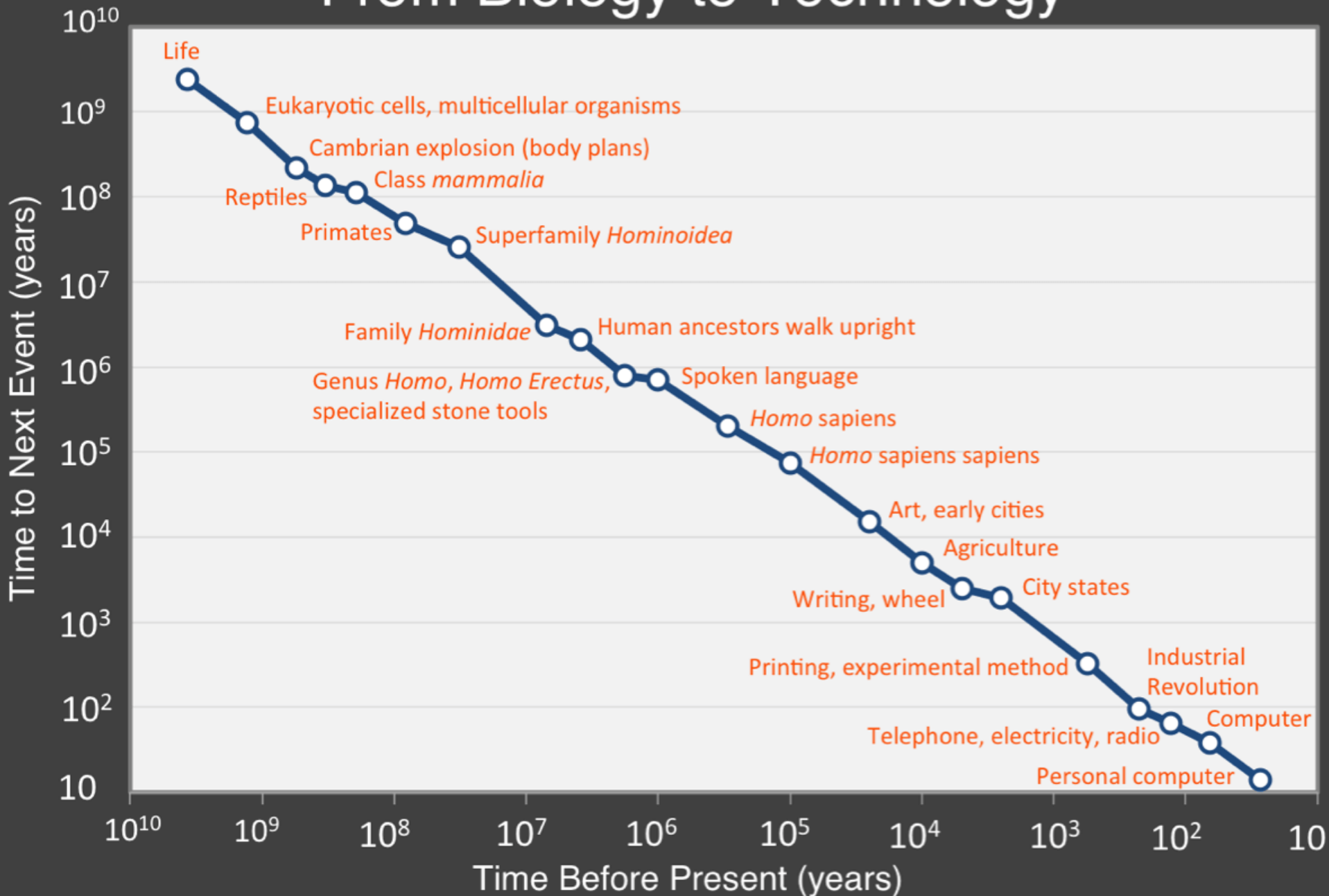
The Fourth Skills Revolution



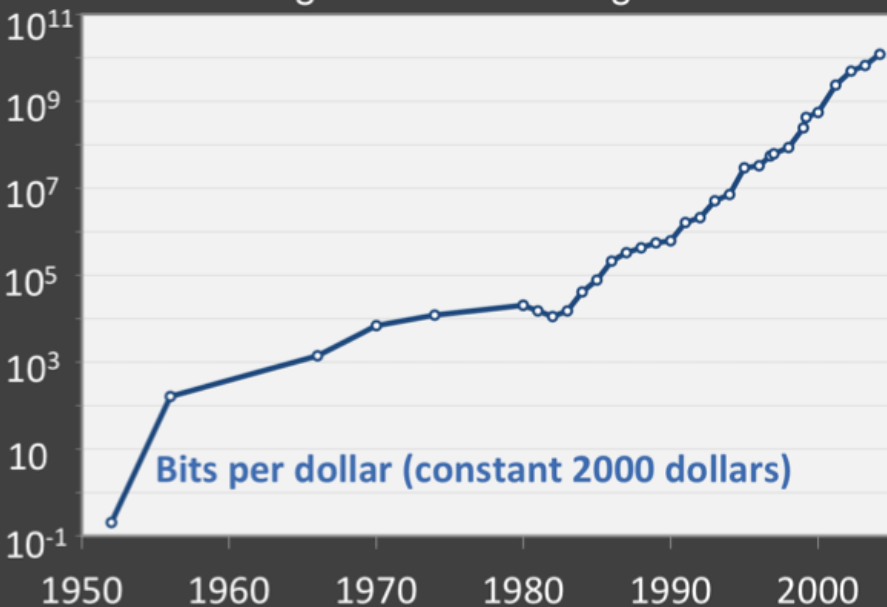
Evolve



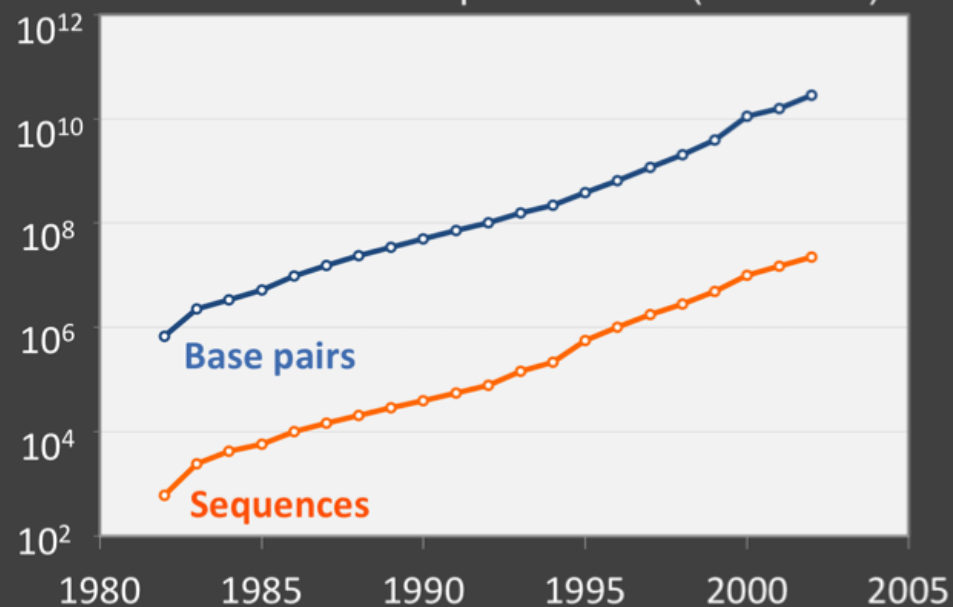
From Biology to Technology



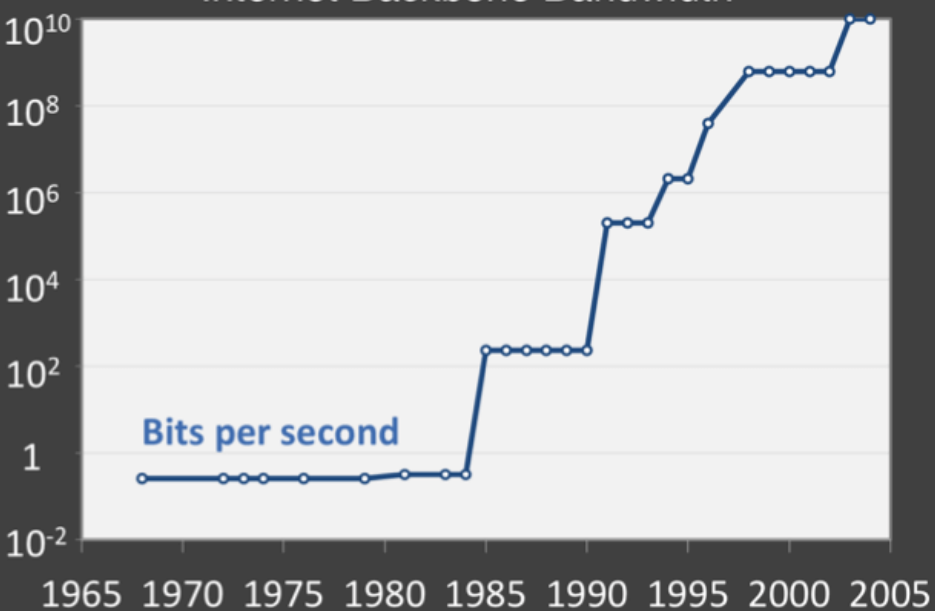
Magnetic Data Storage



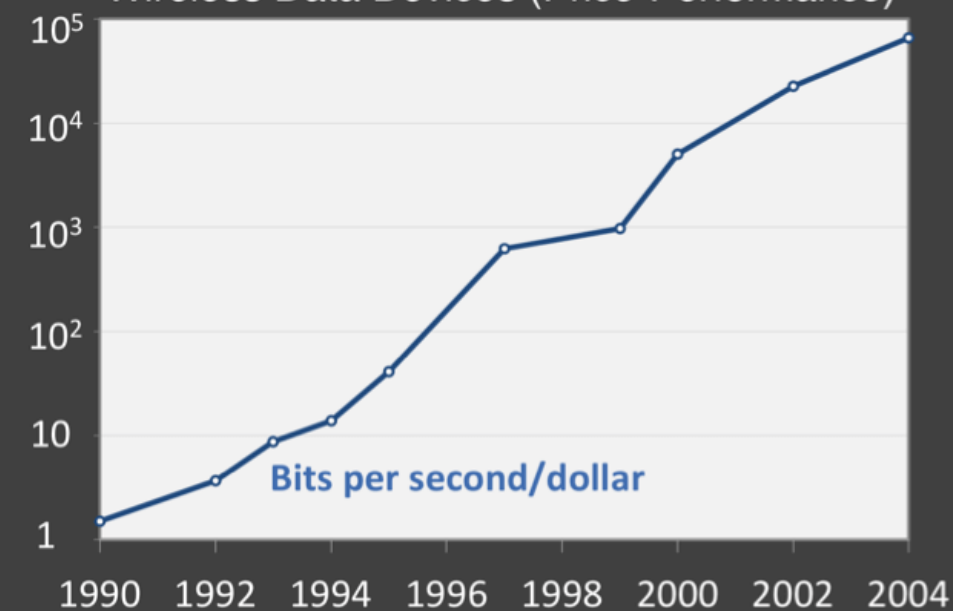
Growth in DNA Sequence Data (Genbank)



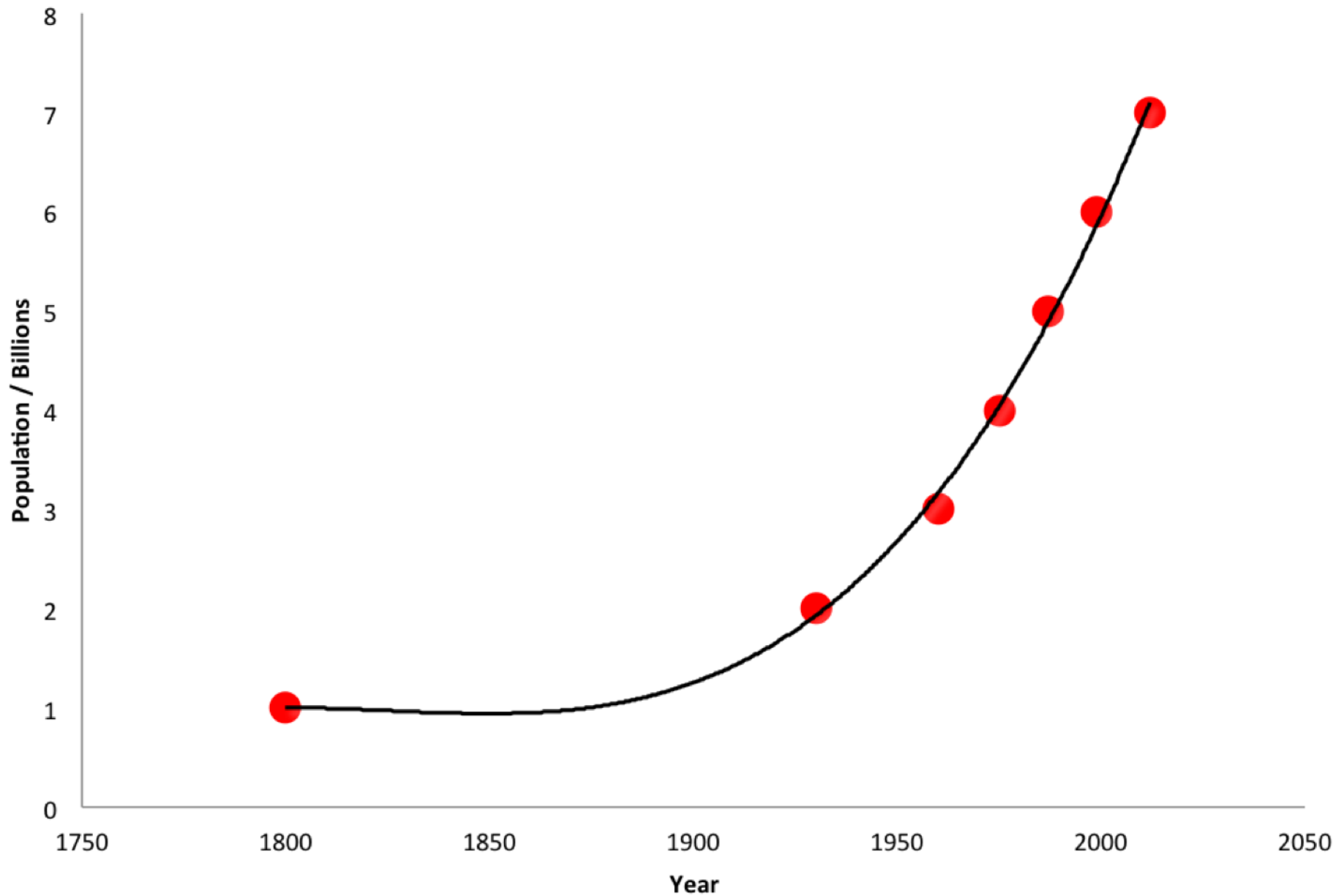
Internet Backbone Bandwidth

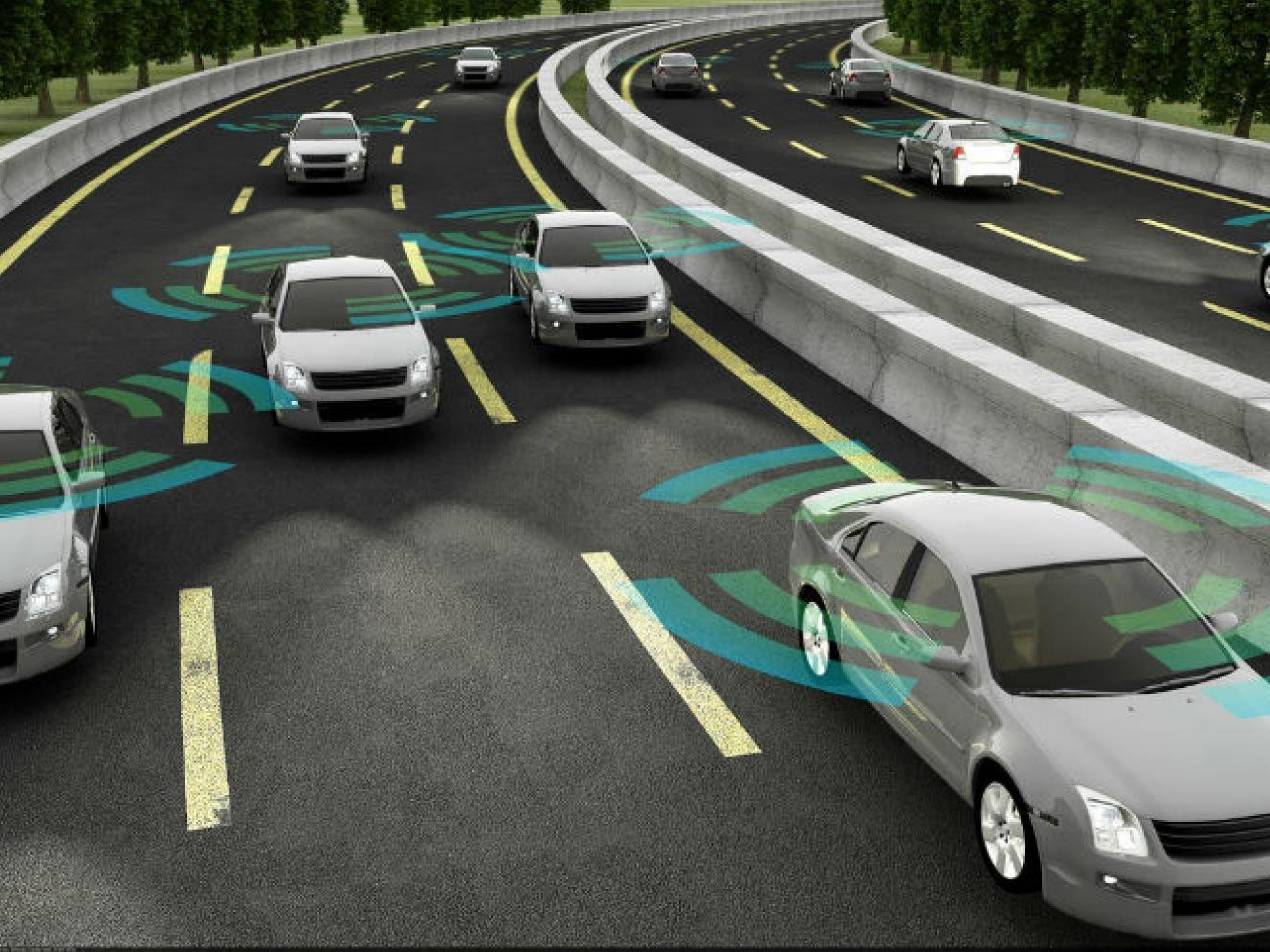


Wireless Data Devices (Price-Performance)

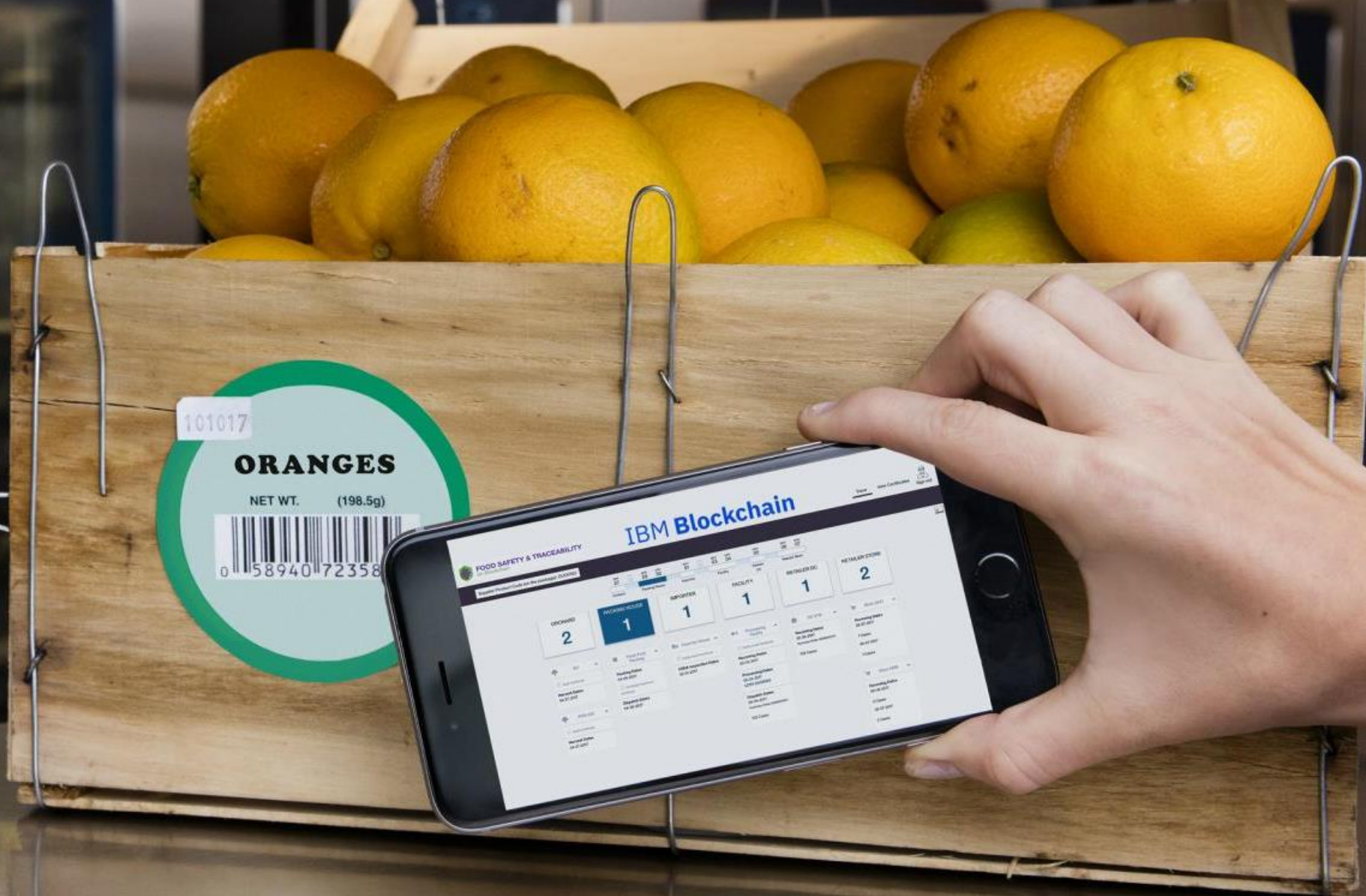


Human Population Growth









Production



Logging Sensors

A series of stand alone dataloggers for standard phytomonitoring sensors



Industrial sensors

A series of phytomonitoring sensors for third-party dataloggers with optional 0-2 V or 4-20 mA output



How it works?

Stem Microvariation Sensors

SPECIFICATIONS:

Linear Measurement Range: 0-5 mm
or 0-10 mm

Diameter Adjustment Range:
4 to 25 mm for SD-5
20 to 70 mm for SD-6
Unlimited for DE-1

Resolution : 2-3 micron

➤ Enable monitoring of stem diameter variations in micron range caused by fluctuations of plant water content and growth.



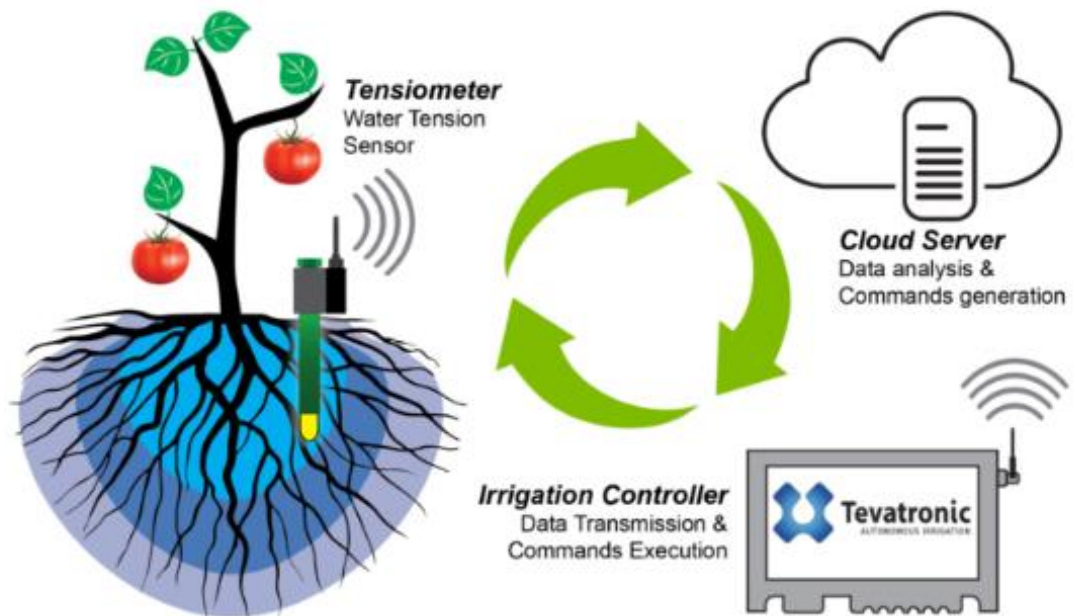




Autonomous Irrigation

We have developed a technological solution that makes growing crops fully autonomous from irrigation and fertilization aspects.

Our system is fully capable of deciding when and how much to irrigate, and it executes the irrigation decision without human intervention.



Farming Technology – From Horse-drawn Ploughs to Agricultural Drones

 Dec 20, 2018, 4:00:00 PM

Ask the average city dweller their impression of life on a farm, and they will probably have an image similar to a pastoral scene in which huge shire horses labour to plough furrows in the rich brown earth while an exhausted ploughman mops his brow. Even those who think instead of a tractor or combine harvester are unlikely to suggest a relationship between farming and advanced technology. In fact, the reality is that the industry is often among the most willing to adopt cutting-edge ideas and the use of devices that promise to simplify difficult or time-consuming tasks and increase efficiency and productivity.



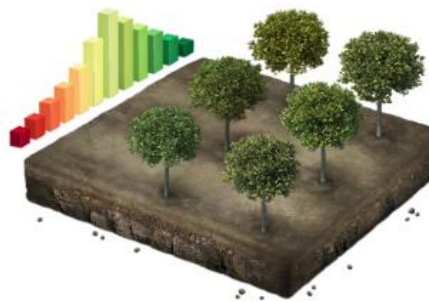
Early problem detection

Farming is risky. Aerobotics uses regular satellite imagery and drone flights to monitor your crop and warn you about potential risks.



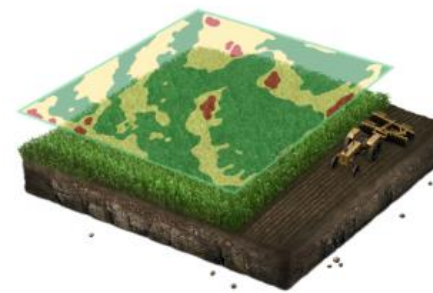
Targeted Scouting

Increase accuracy and save time by planning targeted scouting trips. Our mobile app for iOS and Android will guide you to the root of the problem.



Tree Monitoring

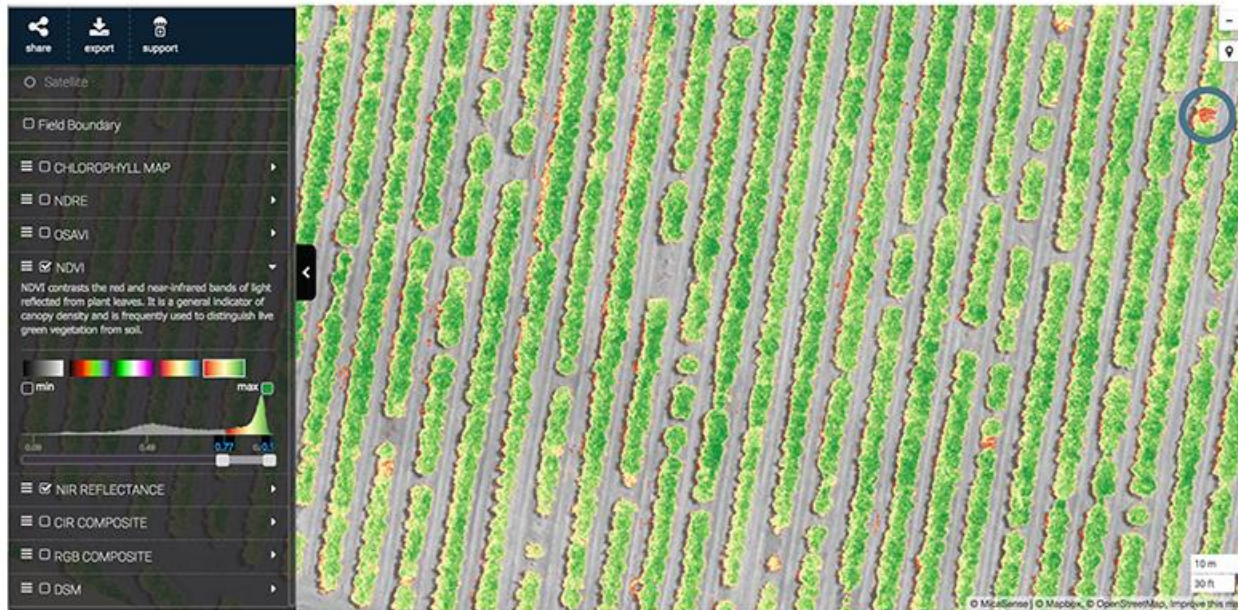
Receive accurate statistics for your orchard with every drone flight including tree health, tree counts, individual tree size and canopy area.



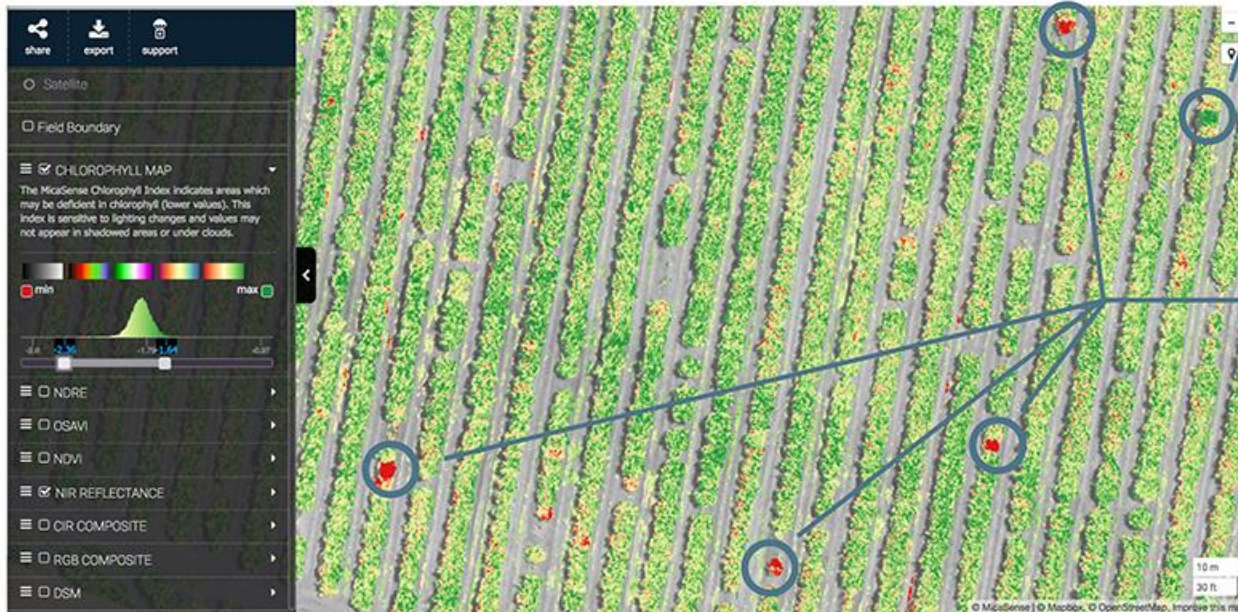
Management Zones

Use our management zones to plan irrigation probe placement, soil and leaf samples and apply variable-rate fertilizers with smart tractors.

NDVI

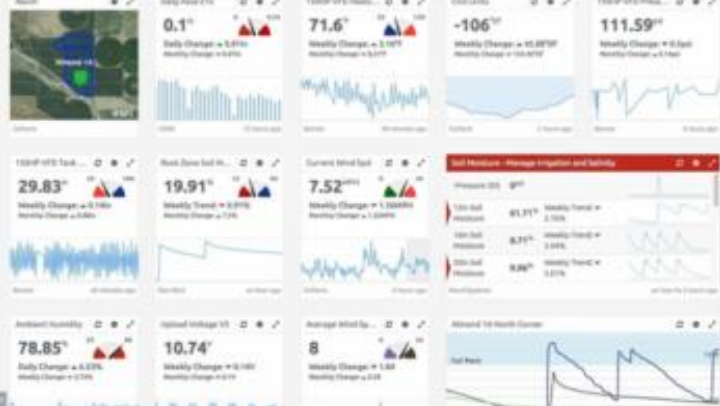


Weeds



Phytophthora

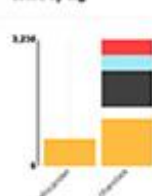
Chlorophyll Map



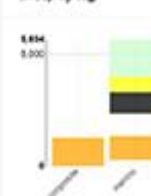
3920 CATTLE 17 BULLS 6917 SHEEP 53 SAMS 32 PADDOCKS

4,428 GRAZED HA 45,068 TOTAL ORE

Cattle by tag



Sheep by tag



Paddocks by tag



Detail

Mobs

Paddocks

Inventory

Timeline

My Crop productions

TOMATO

Current weather:



Cloudy

Temperature:



19.5°C

Wind:



27.5 km/h

Rainfall:



27.5 km/h

Possible pest risk

no active season

Create season



TOMATO



APPLE



PEAR



CHERRY



STRAWBERRY



ORANGE



GRAPES



WHEAT

Weather map





Packing



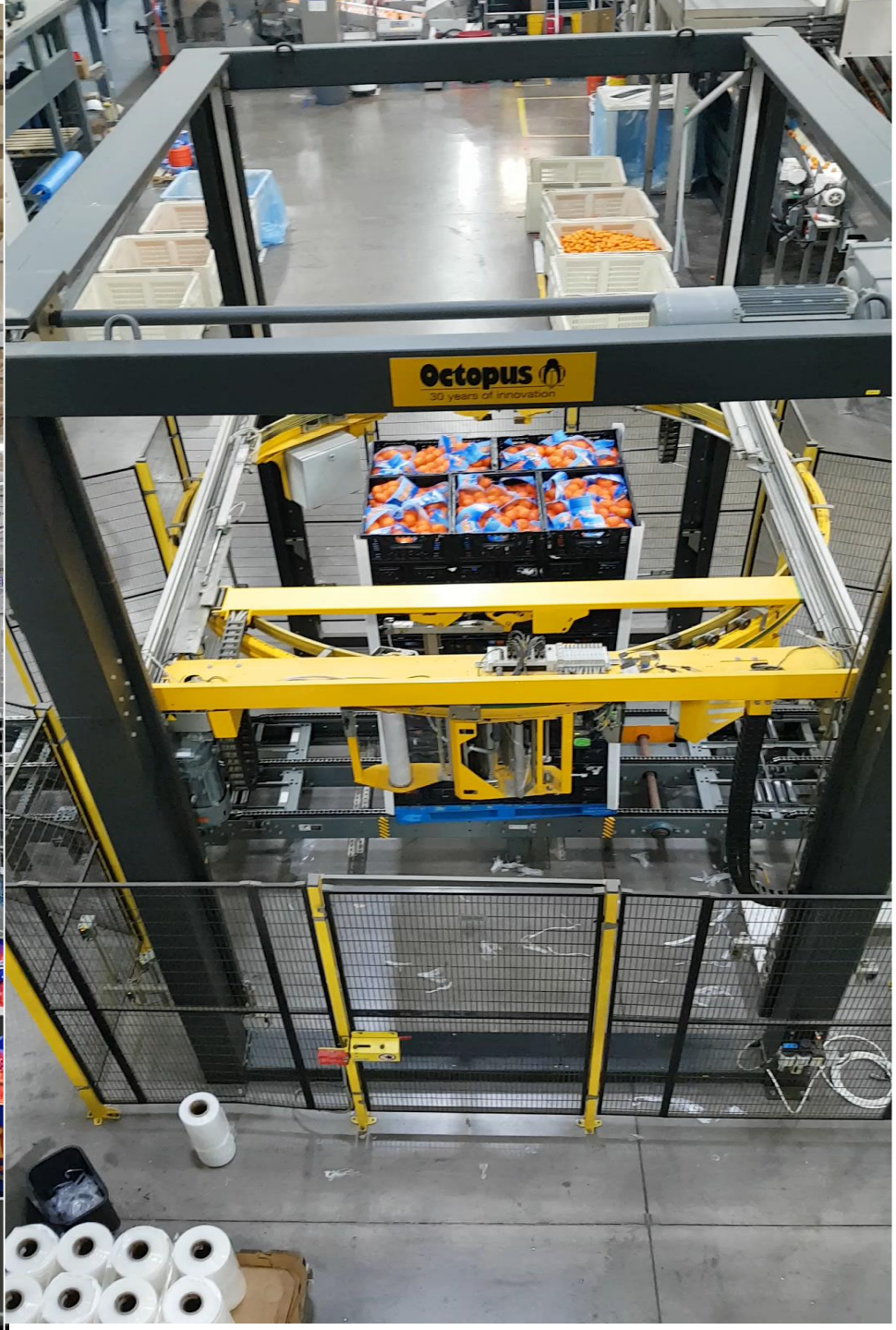
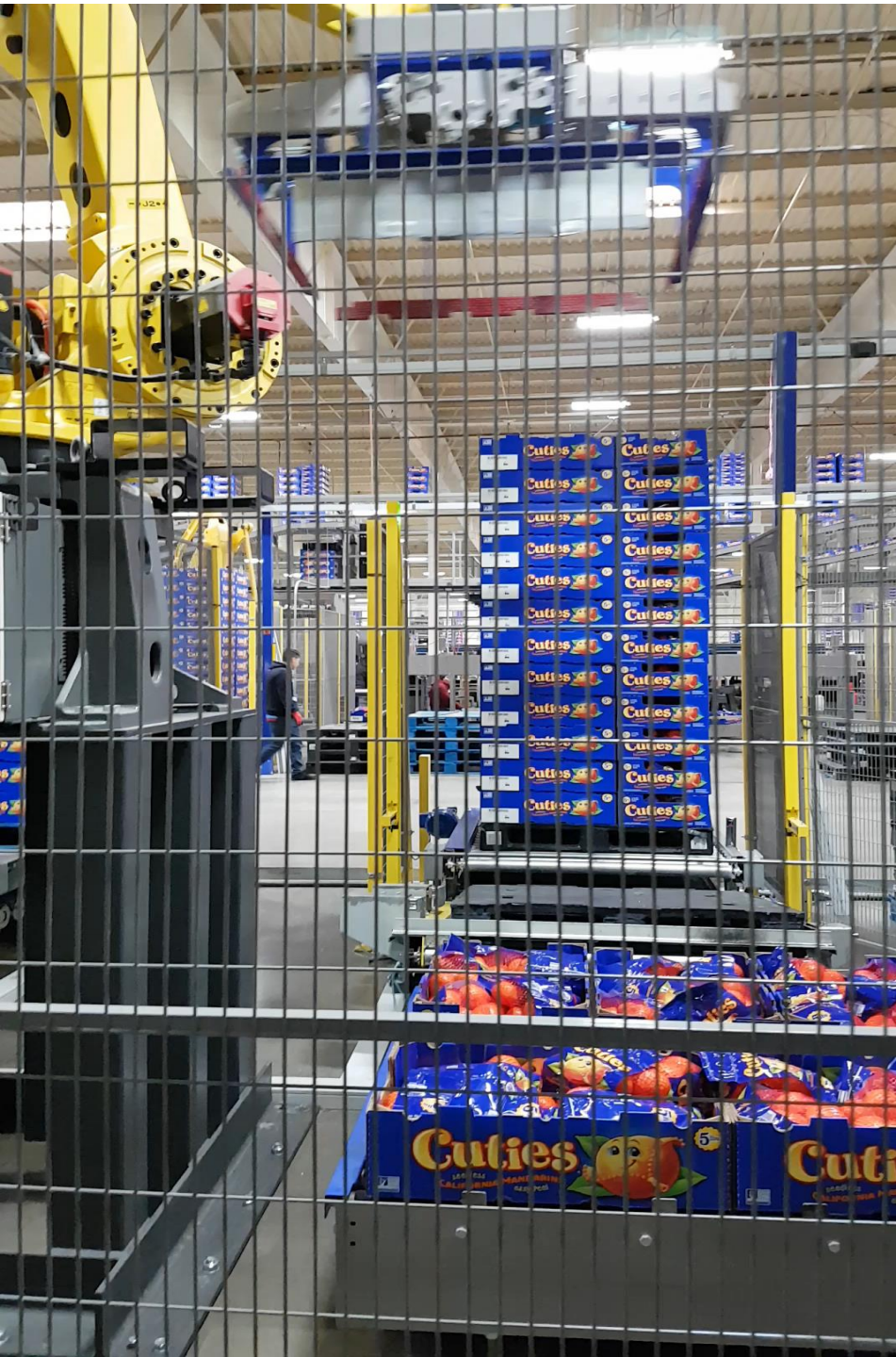


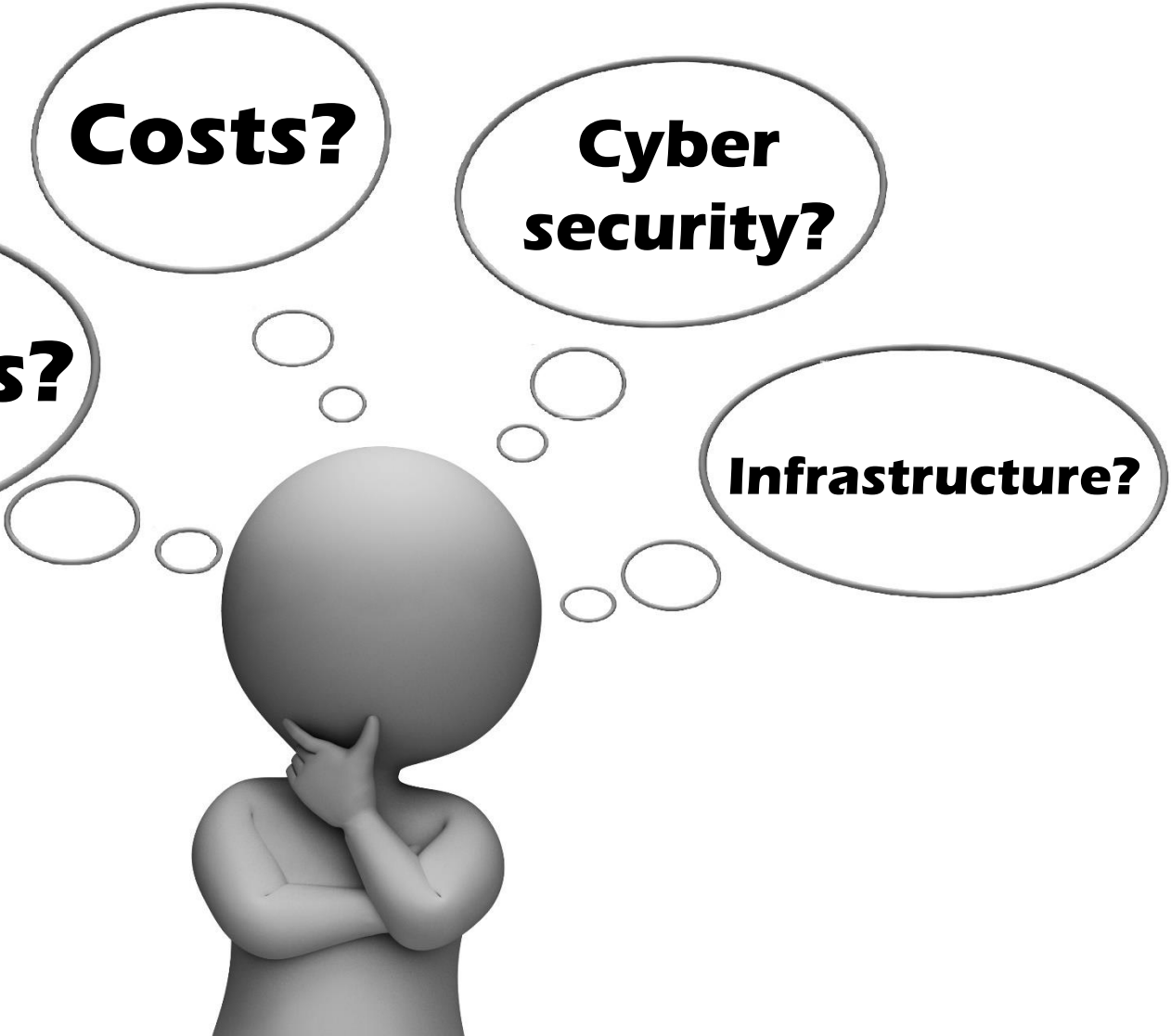






CASEPACKER 90II





Costs?

**Cyber
security?**

Job losses?

Infrastructure?

A photograph of a male teacher with a mustache, wearing a red and blue plaid shirt, leaning over a desk to assist students. Several young students are seated at the desk, each with a computer monitor, keyboard, and mouse. They are all wearing large black headphones, suggesting a language or listening practice session. The teacher is pointing his right index finger towards the screen of one of the students. The background features a light-colored brick wall. The word "Skills" is overlaid in the center of the image in a large, white, sans-serif font.

Skills



A word cloud featuring various terms related to systems and thinking. The words are arranged in a cross-like pattern, with 'SYSTEMS' and 'THINKING' being the largest and most central. Other words include 'INPUT', 'INFLUENCE', 'ENTITY', 'ENERGY', 'COMPLEX', 'INFORMATION', 'PROCESS', 'MATERIAL', 'OVERALL', 'SCIENCE', 'PROBLEM', 'UNDERSTANDING', 'SYSTEM', 'APPROACH', 'SOLVING', 'OUTPUT', and 'COMPONENTS'. The colors used are orange, black, and grey.

INPUT **SYSTEMS** INFORMATION
INFLUENCE **ENTITY** **ENERGY** **COMPLEX**
PROCESS
MATERIAL **OVERALL** **THINKING** PROBLEM
SCIENCE
UNDERSTANDING
SYSTEM
APPROACH **SOLVING** OUTPUT
COMPONENTS

UNDERSTANDING ALGORITHMS

How many shortest-length paths are there to get from your house to the doughnut shop?



$$\binom{n}{k} = \frac{n!}{(n-k)!k!}$$

$$e^{i\pi} + 1 = 0$$

P	Q	R	P V Q	P V R	(P V Q) ∧ (P V R)
T	T	T	T	T	T
T	T	F	T	T	T
T	F	T	T	T	T
T	F	F	T	T	T
F	T	T	T	T	T
F	T	F	T	F	F
F	F	T	F	T	F
F	F	F	F	F	F

7, 11, 15, 19, 23...

$$\begin{aligned} a_1 - a_0 &= 4 \\ a_2 - a_1 &= 4 \\ a_3 - a_2 &= 4 \\ &\vdots \\ + a_n - a_{n-1} &= 4 \\ \hline a_n - a_0 &= 4n \end{aligned}$$

$$a_n = a_0 + 4n$$



Find $7 + 12 + 17 + 22 + \dots + 342$.

$$S_n = 7 + 12 + 17 + 22 + \dots + 342$$

$$+ S_n = 342 + 337 + 332 + 327 + \dots + 7$$

$$2S_n = 349 + 349 + 349 + 349 + \dots + 349$$

$$2S_n = 349 \cdot 68$$

$$S_n = \frac{349 \cdot 68}{2}$$

$$S_n = 11866$$



Original:

$$\exists x \forall y (x \geq 2y \rightarrow x > y + 1)$$

Converse:

$$\exists x \forall y (x > y + 1 \rightarrow x \geq 2y)$$

Negation:

$$\neg [\exists x \forall y (\neg (x \geq 2y) \vee x > y + 1)]$$

$$\forall x \exists y (x \geq 2y \wedge x \leq y + 1)$$

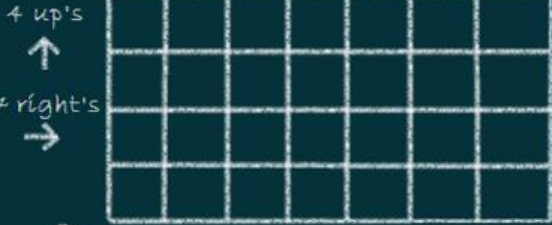
Contrapositive:

$$\exists x \forall y (x \leq y + 1 \rightarrow x < 2y)$$

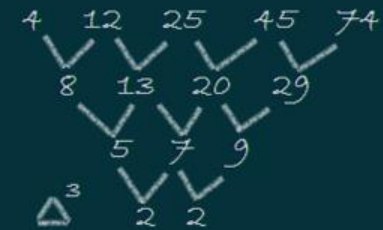
$$v - e + f = 2$$

P.I.E. Example:

$$6! - \left[\binom{6}{1}5! - \binom{6}{2}4! + \binom{6}{3}3! - \binom{6}{4}2! + \binom{6}{5} - 1 \right]$$



$$\binom{11}{7} = \binom{11}{4} = 330 \text{ paths}$$



Onto



One-to-One



There are six dogs to give 13 tacos.

use a 'stars and bars' diagram to illustrate the first and sixth dog get 3 tacos, the second dog gets none, the third dog gets 5 and the fourth dog gets one.



$$A = \{2, 4, \textcircled{1}, \textcircled{2}\}$$

$$(A \cup B \cup C) \cup (A \cap B \cap C)$$



***We have time, but we
have to start now.***

***We have to make it
happen.***

OUR PROGRAMS



NASA MAA

Students will learn about STEM through fun and exciting activities with our NASA designed curriculum. This program is 8 weeks long and is offered on Saturdays at your student's school site. Hartnell NASA MAA is one of only nine sites in the Nation!



CODER DOJO

CoderDojo Hartnell College (CDHC) is an Educational Program brought by Hartnell College. CDHC is a fun and FREE computer-coding club where young people can learn how to develop websites, web applications, and games.



MAKER SPACE

Makerspace is a creative, DIY spaces where people can gather to create, invent, and learn. We offer 3D printers, software, electronics, craft and hardware supplies and tools, and more to develop and ignite an interest in young participants to create!









Thank you!

Jacomien de Klerk

jacomien@citrusacademy.org.za

082 496 5510

