



Re-Wiring For Our Future

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Co-Founder, CTO Nanogirl Labs

 medickinson

HOW DID YOU GET HERE?



HOW DOES BREAD BECOME TOAST?



**HEATING
FILAMENTS!**



**Push cassette into
box, cartoons
appear!**



Turning ferric
oxide into
pictures



HOW ARE LAPTOPS SO SMALL?



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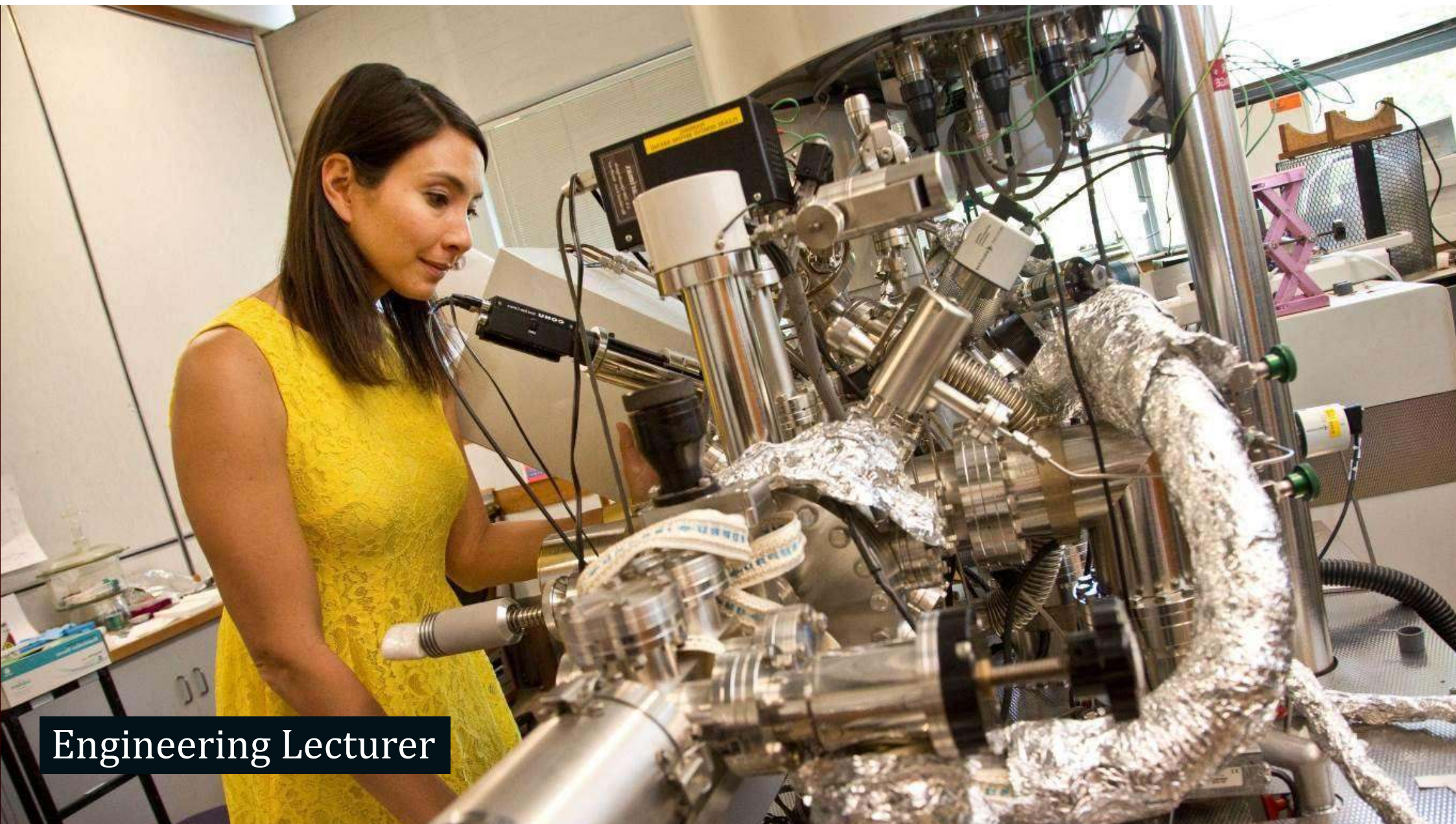




SOLID STATE HARD DRIVES!

CURIOSITY AND TINKERING PROVIDE DEEP
LEARNING EXPERIENCES

WHEN THINKING ABOUT EDUCATION WE NEED
TO REMEMBER WHAT LEARNING MEANS TO US



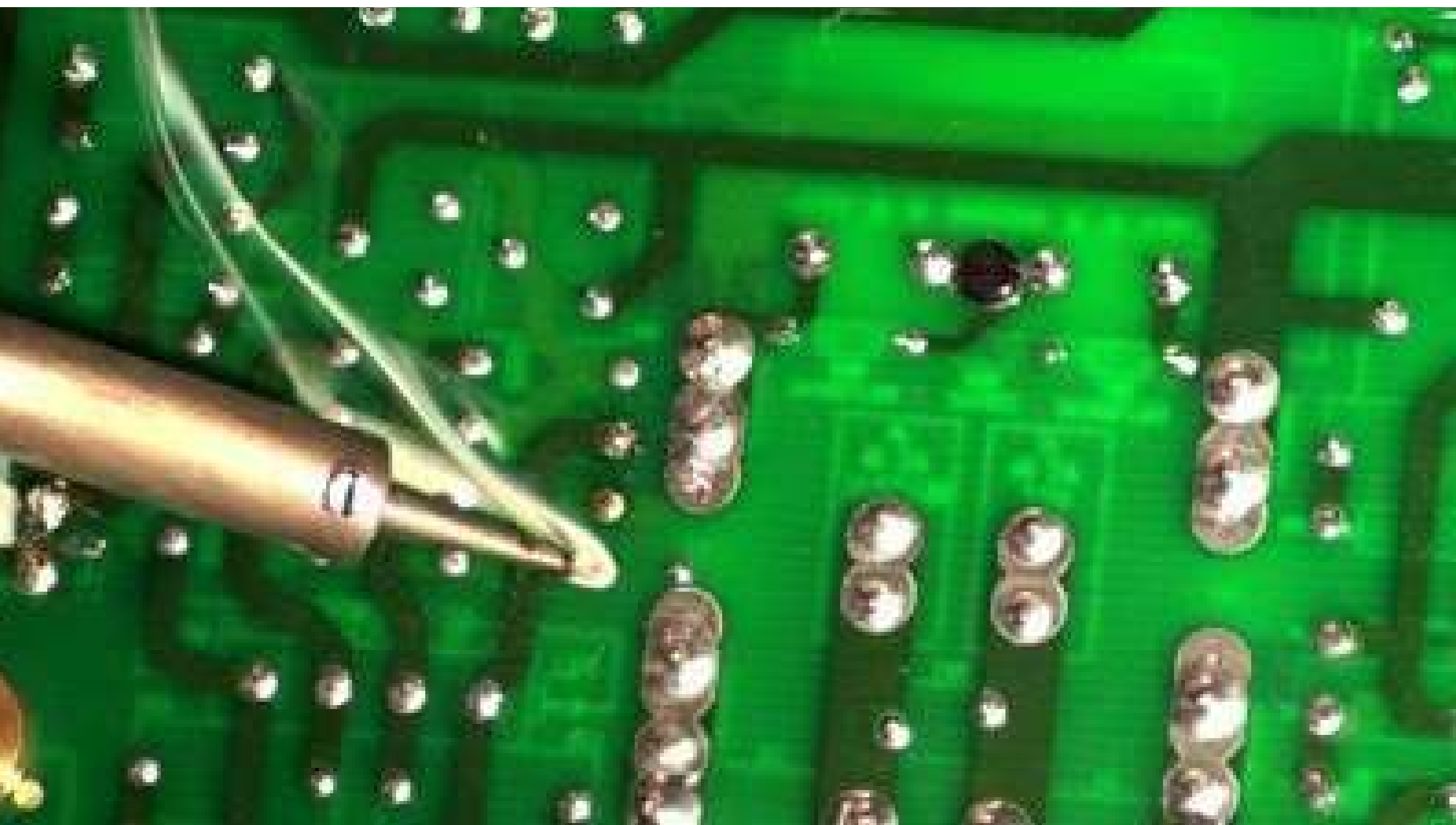
Engineering Lecturer

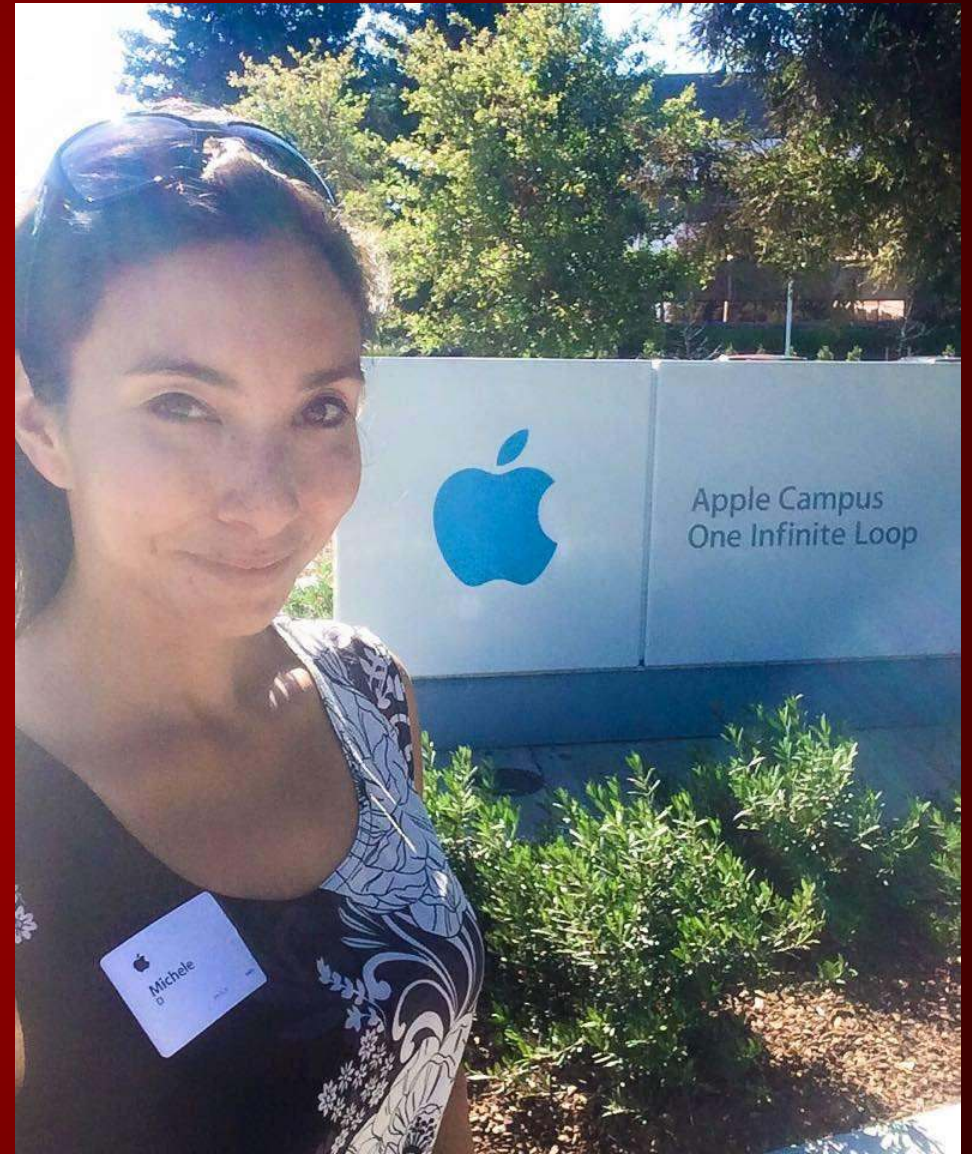


Nanotechnology Researcher



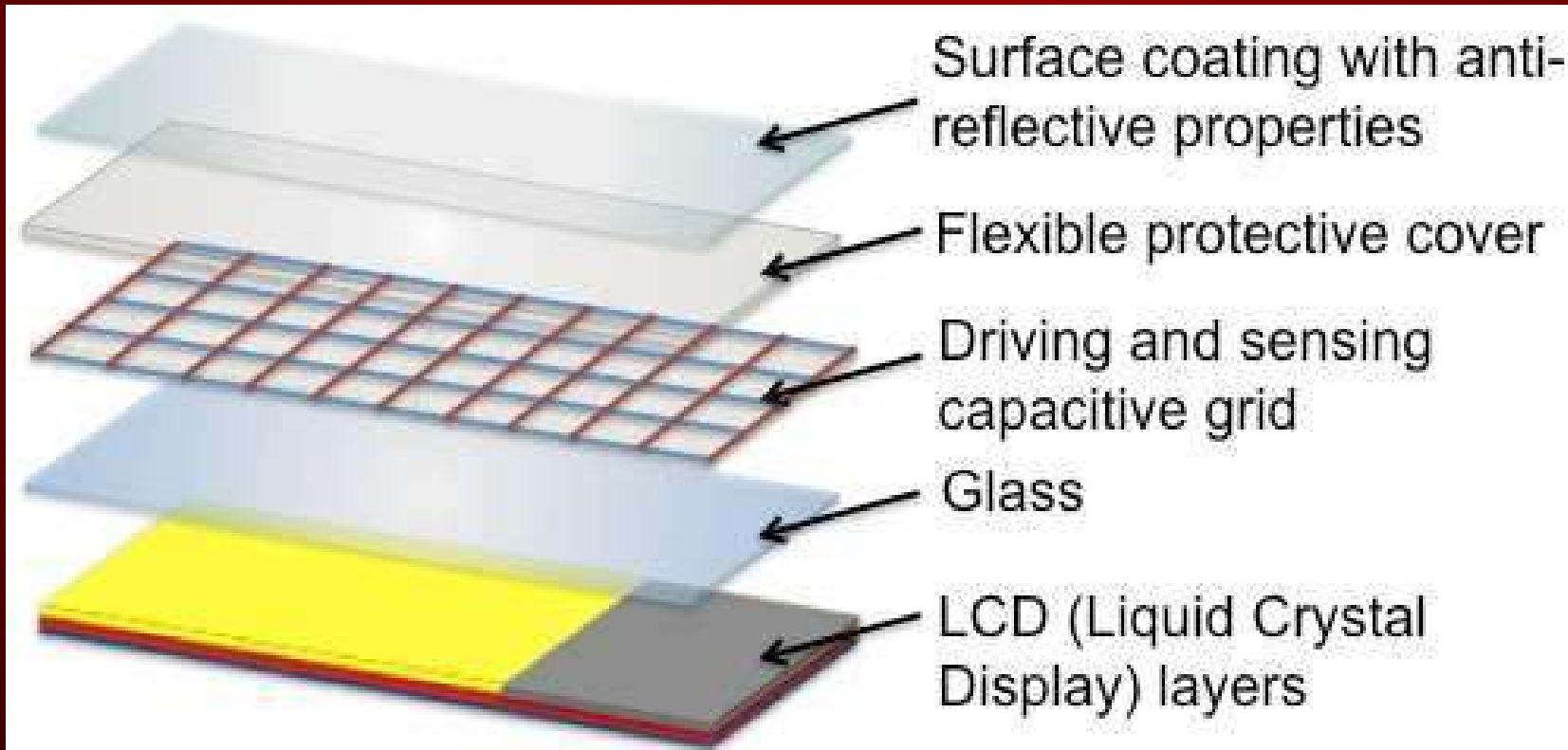






Touchscreens

Use the atoms in your finger to interact with your device



YOU CAN DESIGN THE BEST
TECHNOLOGY IN THE WORLD

BUT YOU CAN'T CONTROL HOW PEOPLE
WILL USE IT



Generalized Griffith-Irwin Concept



Equations (1)-(3) are proved experimentally and now present the linear fracture mechanics of materials (LFM).

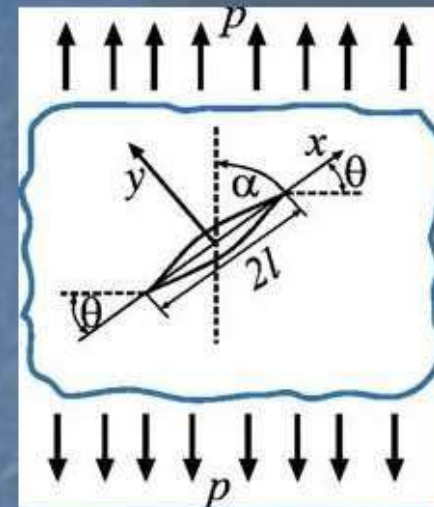
$$K_I(p, l) \neq 0, K_{II}(p, l) \neq 0, K_{III}(p, l) \neq 0$$

Tension of the plate with the arbitrary oriented crack

$$\lim_{r \rightarrow 0} \sqrt{2\pi r} \sigma_{\theta\theta}(\alpha, p_*, r, \theta_*) = K_{Ic},$$

$$\lim_{r \rightarrow 0} \sqrt{2\pi r} \left\{ \frac{\partial \sigma_{\theta\theta}(\alpha, p, r, \theta)}{\partial \theta} \bigg|_{\theta=\theta_*} \right\} = 0,$$

where θ_* is the angle of the initial direction of crack growth



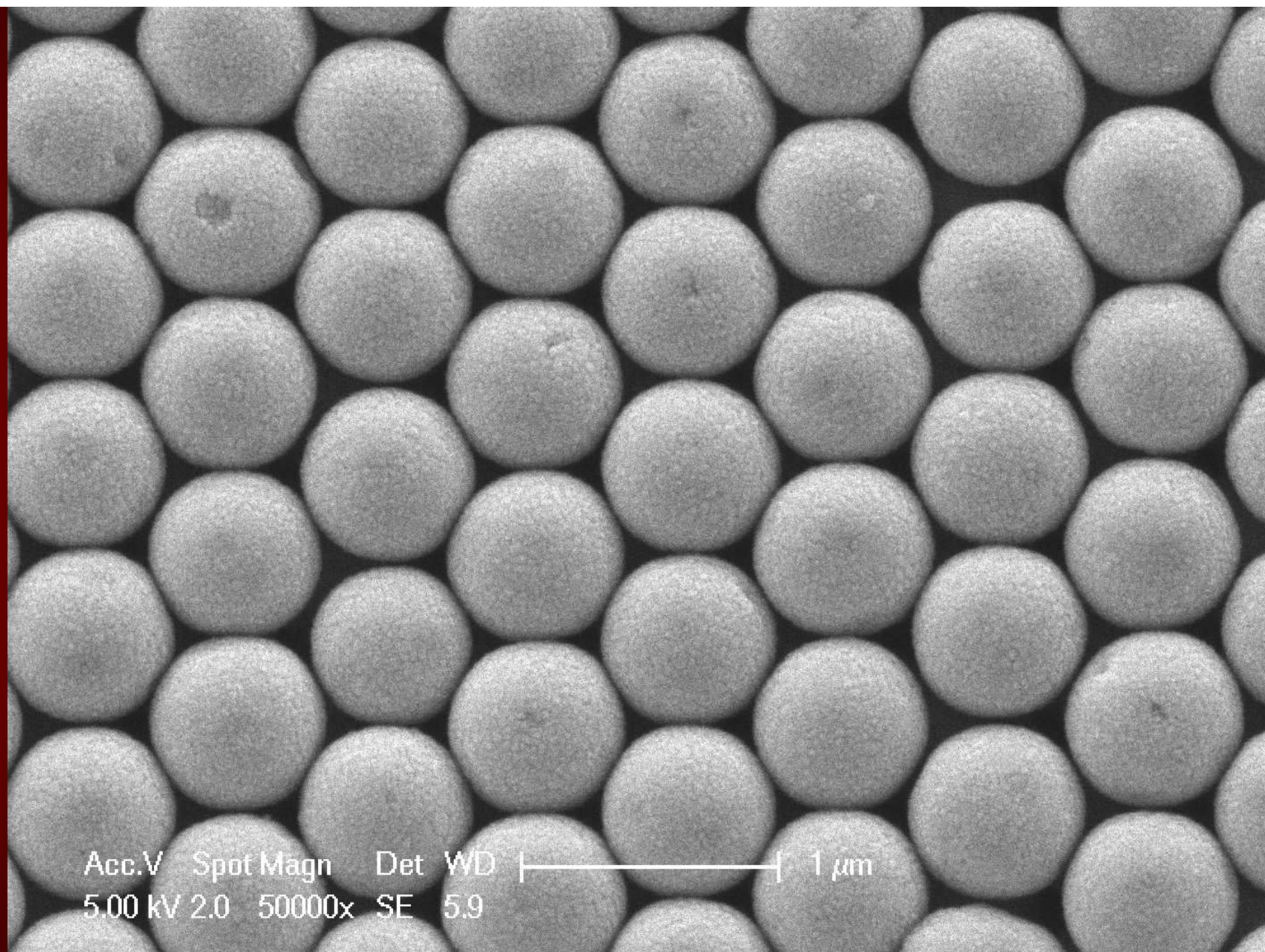
$$\cos^3 \frac{\theta_*}{2} \left[K_{I0}(p_*, \alpha, l) - 3 \operatorname{tg} \frac{\theta_*}{2} K_{II0}(p_*, \alpha, l) \right] = K_{Ic}, \quad (1)$$

$$\theta_* = 2 \operatorname{arctg} \frac{K_{I0} - \sqrt{K_{I0}^2 + 8K_{II0}^2}}{4K_{II0}}, \quad K_{I0} > 0, \quad K_{II0} \neq 0, \quad (2)$$

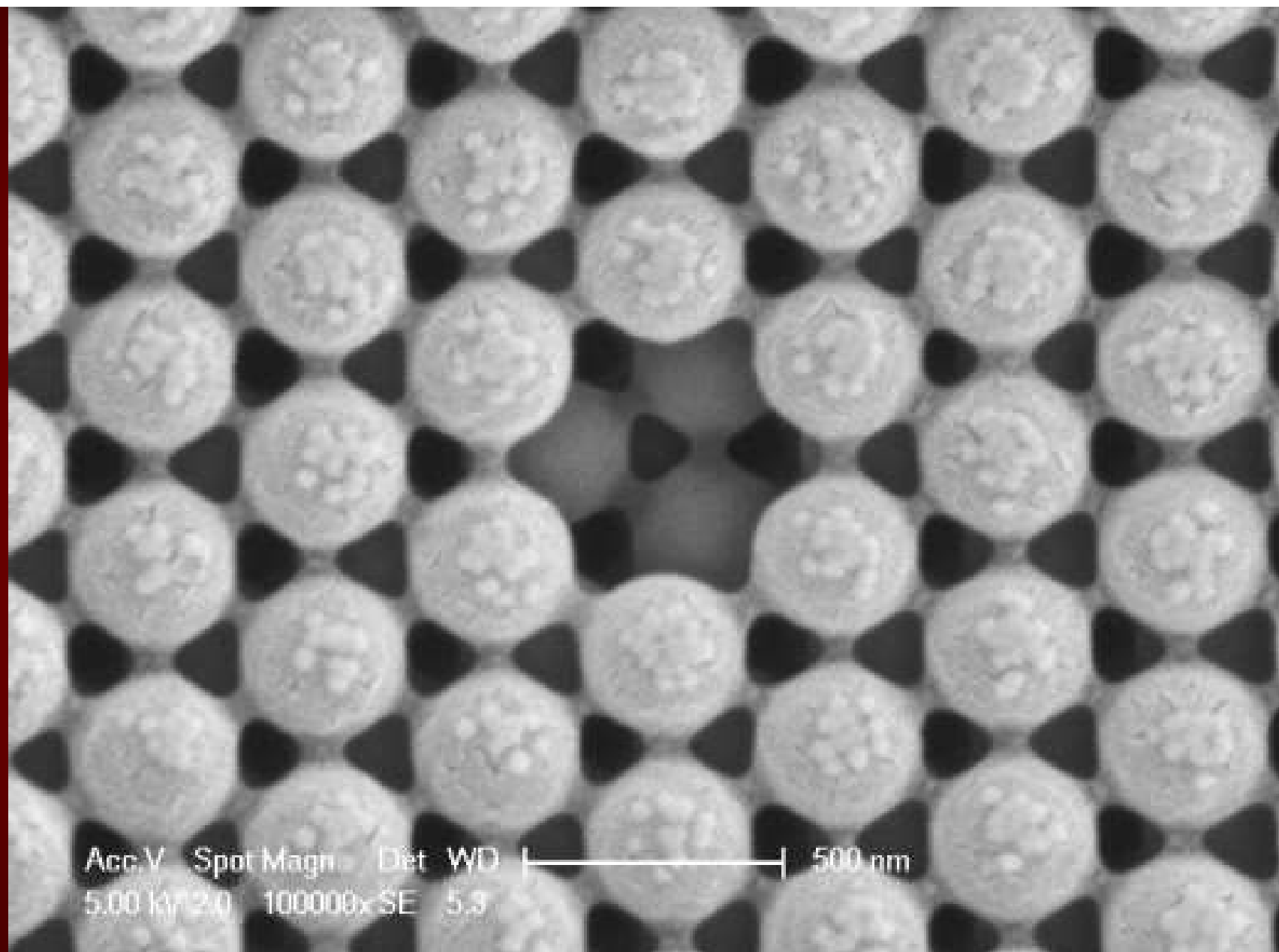
$$K_{I0} = p\sqrt{\pi l} \sin^2 \alpha, \quad K_{II0} = p\sqrt{\pi l} \sin \alpha \cos \alpha \quad (3)$$

Equations (1) and (2) were generalized (O.Ye.Andreikiv et al) for the case $K_{I0} \neq 0, K_{II0} \neq 0, K_{III0} \neq 0$





Acc.V Spot Magn Det WD |-----| 1 μ m
5.00 kV 2.0 50000x SE 5.9



Generalized Griffith-Irwin Concept



Equations (1)-(3) are proved experimentally and now present the linear fracture mechanics of materials (LFM).

$$K_I(p, l) \neq 0, K_{II}(p, l) \neq 0, K_{III}(p, l) \neq 0$$

Tension of the plate with the arbitrary oriented crack

$$\lim_{r \rightarrow 0} \sqrt{2\pi r} \sigma_{\theta\theta}(\alpha, p_*, r, \theta_*) = K_{I*},$$

$$\lim_{r \rightarrow 0} \sqrt{2\pi r} \left\{ \frac{\partial \sigma_{\theta\theta}(\alpha, p, r, \theta)}{\partial \theta} \bigg|_{\theta=\theta_*} \right\} = 0,$$

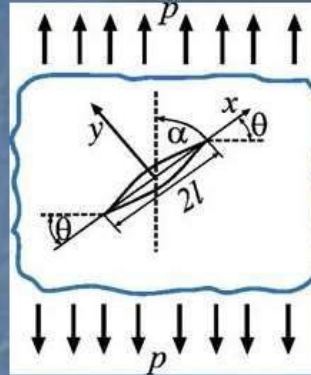
where θ_* is the angle of the initial direction of crack growth

$$\cos^3 \frac{\theta_*}{2} \left[K_{I0}(p_*, \alpha, l) - 3 \operatorname{tg} \frac{\theta_*}{2} K_{II0}(p_*, \alpha, l) \right] =$$

$$\theta_* = 2 \operatorname{arctg} \frac{K_{I0} - \sqrt{K_{I0}^2 + 8K_{II0}^2}}{4K_{II0}}, \quad K_{I0} > 0,$$

$$K_{I0} = p\sqrt{\pi l} \sin^2 \alpha, \quad K_{II0} = p\sqrt{\pi l} \sin \alpha \cos \alpha$$

Equations (1) and (2) were generalized (O.Ye.Andreikiv et al) for the case $K_{I0} \neq 0, K_{II0} \neq 0$



THE FUTURE OF TERTIARY EDUCATION

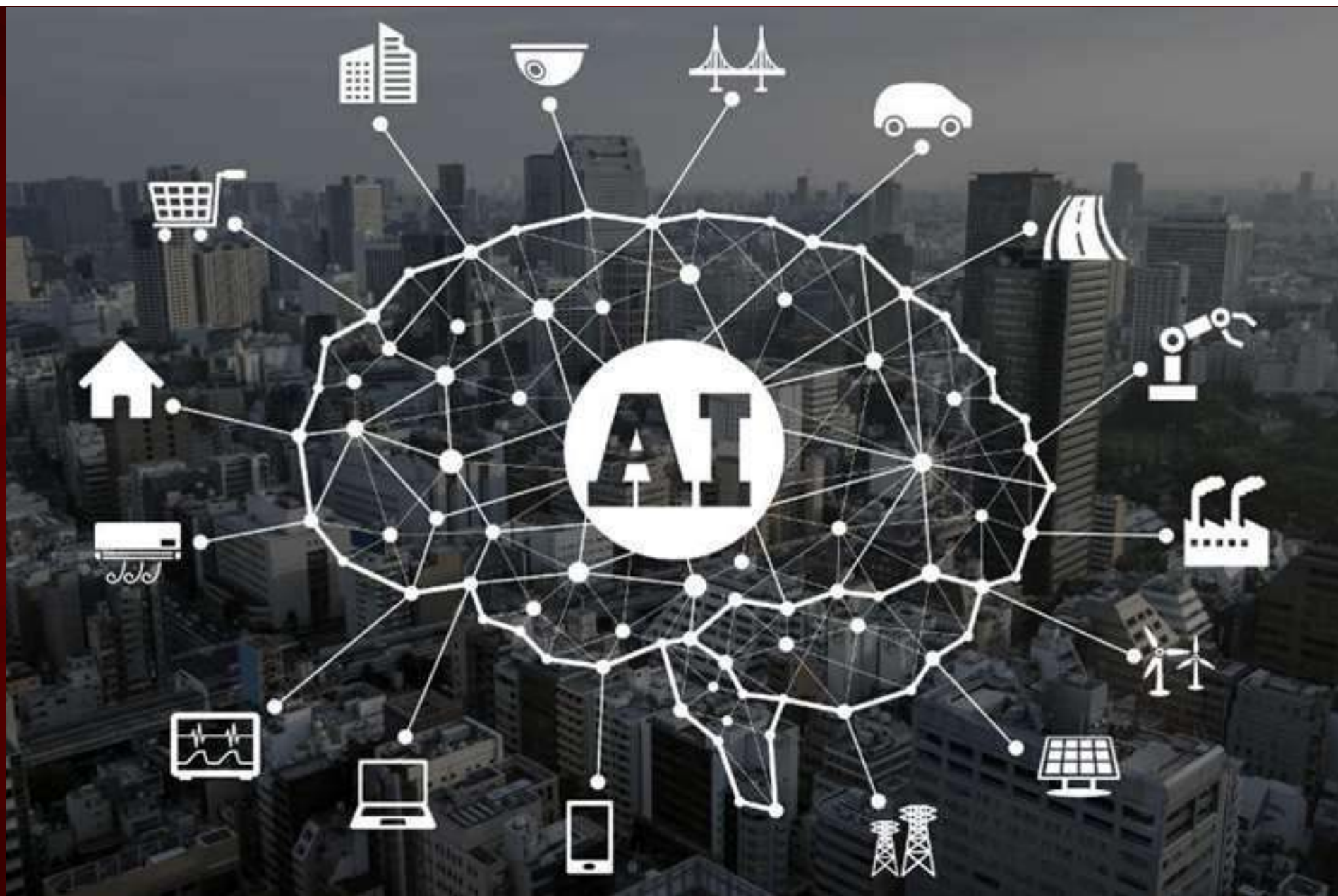


CAN WE CREATE HUMAN EXPERIENCES WITH DIGITAL TECHNOLOGY?

This is not a real person

THE FUTURE OF TECHNOLOGY IN TERTIARY EDUCATION







ROSS

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AI Meets Legal Research

ROSS is an advanced legal research tool that harnesses the power of artificial intelligence to make the research process more efficient.

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EDITOR'S PICK | 27,774 views | Jun 28, 2018, 11:51am

This AI Just Beat Human Doctors On A Clinical Exam



Parmy Olson Forbes Staff

AI, robotics and the digital transformation of European business.



COMPETENCY BASED LEARNING



EXPECTATION OF EVERYTHING AVAILABLE ANYWHERE, ANYTIME



INNOVATE



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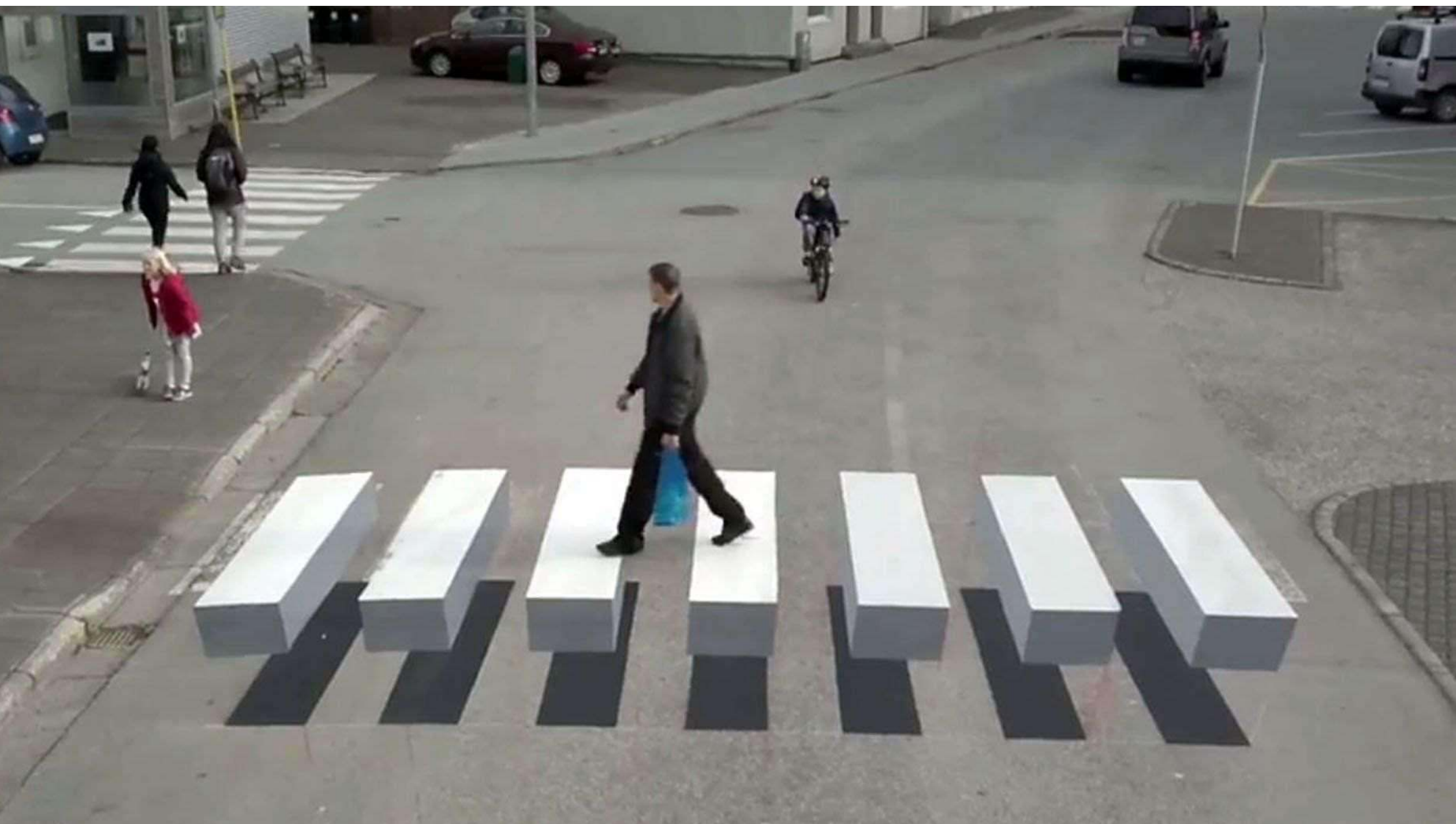
WHAT MAKES
INNOVATIVE
PEOPLE TICK?

No. 8 Re-charged
Kitchen Science Cookbook

Innovators see normal things in a different way







Uber did not kill the taxi business.



Limited access and fare control did.

Netflix did not kill blockbuster.



Ridiculous late fees did.

Apple did not kill the music industry.



Being forced to buy
full-length albums did

**Technology by itself is not the
disruptor.**

**Not being customer centric is the
biggest threat to business.**

WHO IS YOUR CUSTOMER?

WHAT DEVICE DOES YOUR CUSTOMER USE?

Death of screens









Death of touchpads





You can't predict the future



WHAT DOES TERTIARY EDUCATION LOOK LIKE?

Death of Lectures









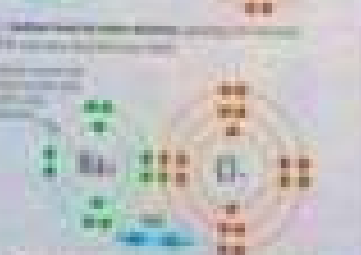
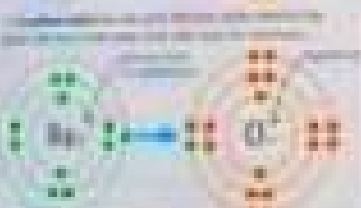
Ionic bonding

When a metal reacts with a non-metal, a giant ionic lattice is formed. This is made of alternating positive and negative ions.

Electrons are transferred from the metal to the non-metal. This creates the ionic lattice.

What is an ion?

An ion is an atom or molecule that has a net electrical charge. It is formed by the loss or gain of electrons.



The resulting ionic lattice is a giant structure of alternating positive and negative ions. It is held together by strong electrostatic forces.

Octet rule

Atoms tend to form ions so that they have a full outer shell of electrons. This is known as the octet rule.

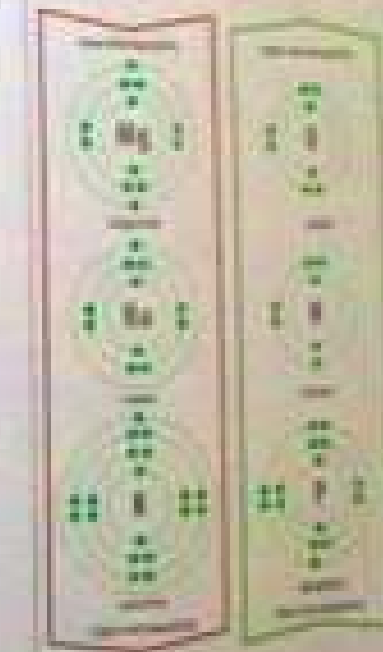
Atom	Electron configuration	Ion	Electron configuration
K	2, 8, 1	K ⁺	2, 8
Br	2, 8, 18, 7	Br ⁻	2, 8, 18, 8
Ca	2, 8, 2	Ca ²⁺	2, 8
O	2, 6	O ²⁻	2, 8
Al	2, 8, 3	Al ³⁺	2, 8
Cl	2, 8, 7	Cl ⁻	2, 8, 8

The octet rule states that atoms tend to form ions so that they have a full outer shell of eight electrons. This is why sodium loses one electron to become Na⁺ and chlorine gains one electron to become Cl⁻.

Reactivity

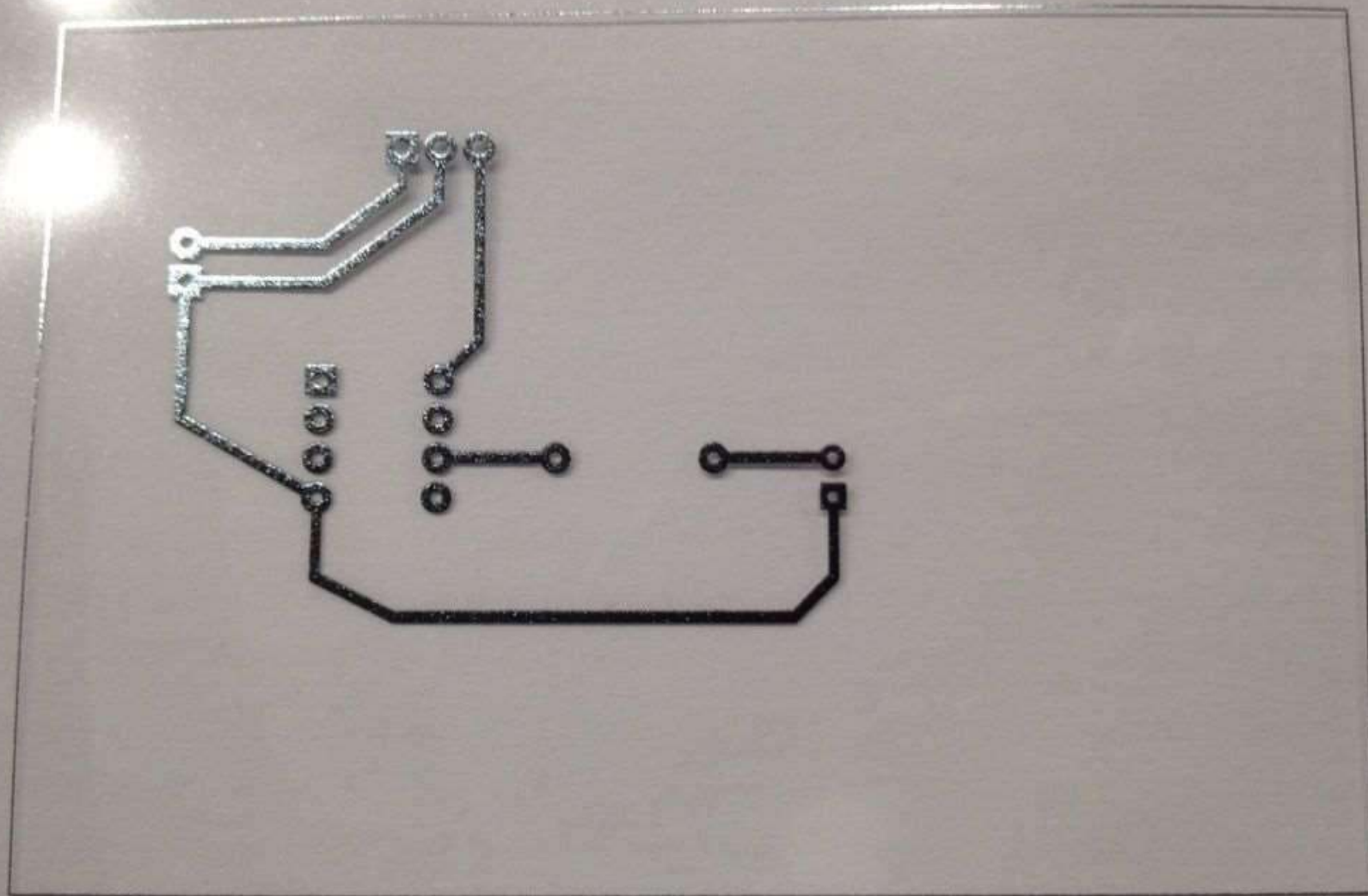
The reactivity of an element is a measure of how easily it reacts with other elements. It is determined by the number of electrons in the outer shell.

Metals are more reactive than non-metals. This is because metals have fewer electrons in their outer shell. They are more likely to lose electrons and form positive ions.

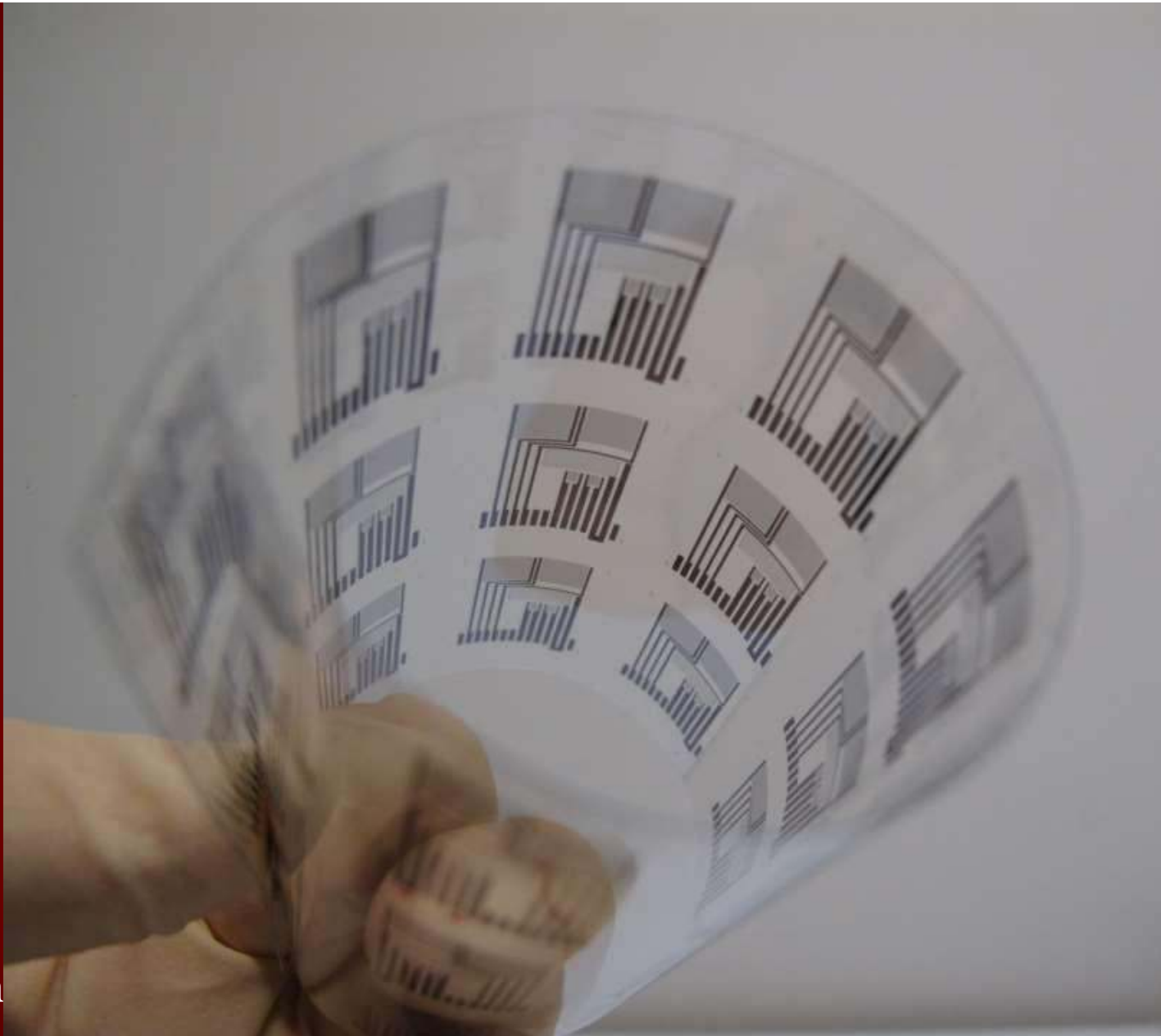


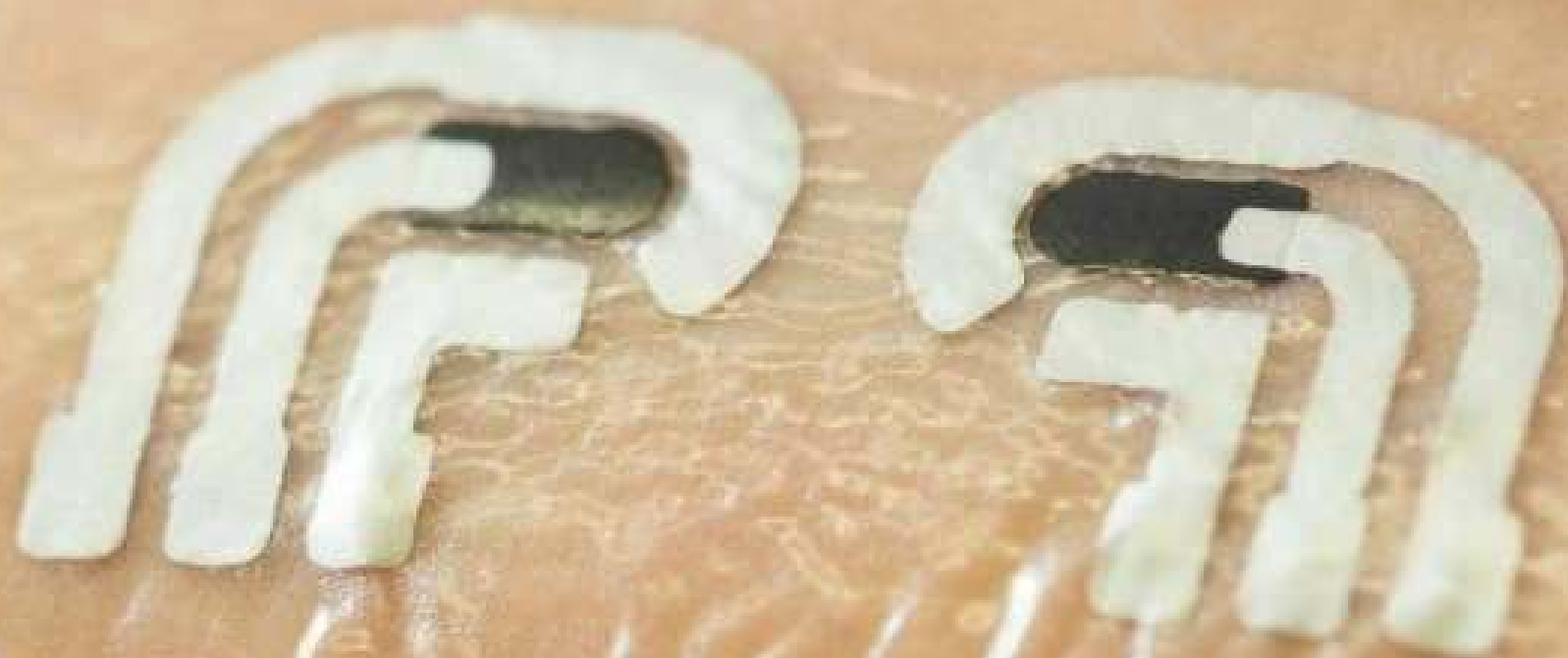


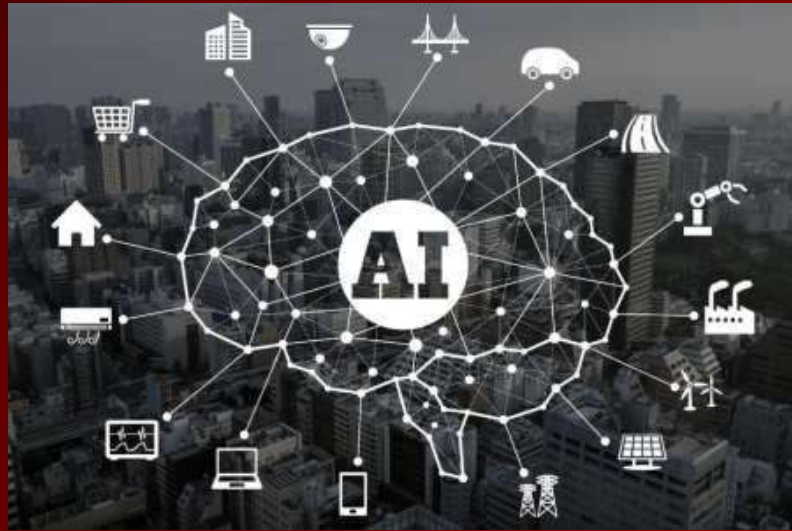




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Curtin University in IoT rollout

University combining data visualisation, video analytics, and live face matching technologies



Byron Connolly (CIO)
08 May, 2017 12:36



© Curtin



Curtin University is rolling out 'Internet-of-things (IoT)' software and devices that will provide advanced data insights to help with the daily running and usage of its large Perth campus.

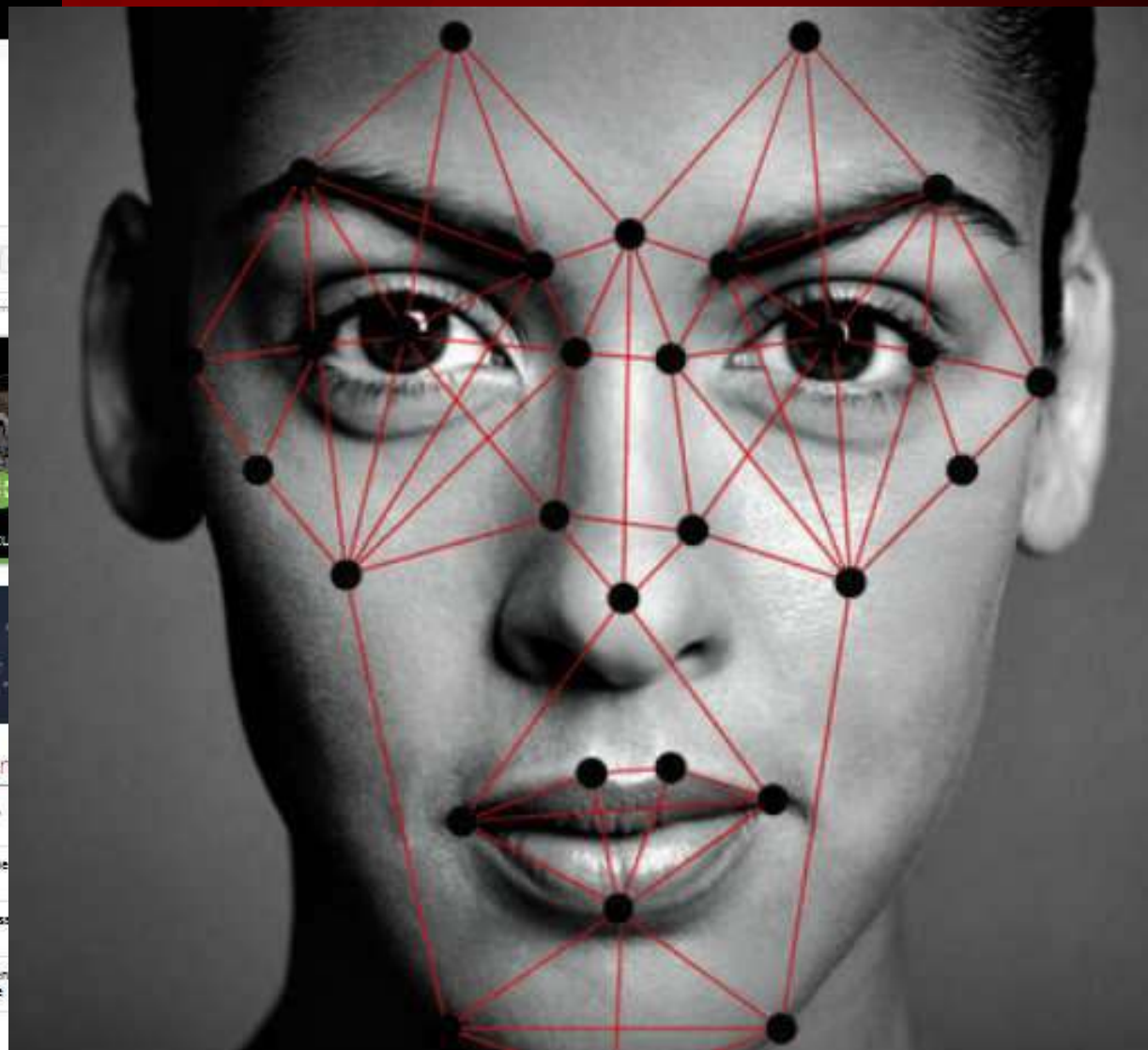
The university is using an IoT solution, supplied by Hitachi, to advance its 'smart campus' deployment, which it said improves the student experience and classroom learning, and attracts industry to collaborate on data-driven research.

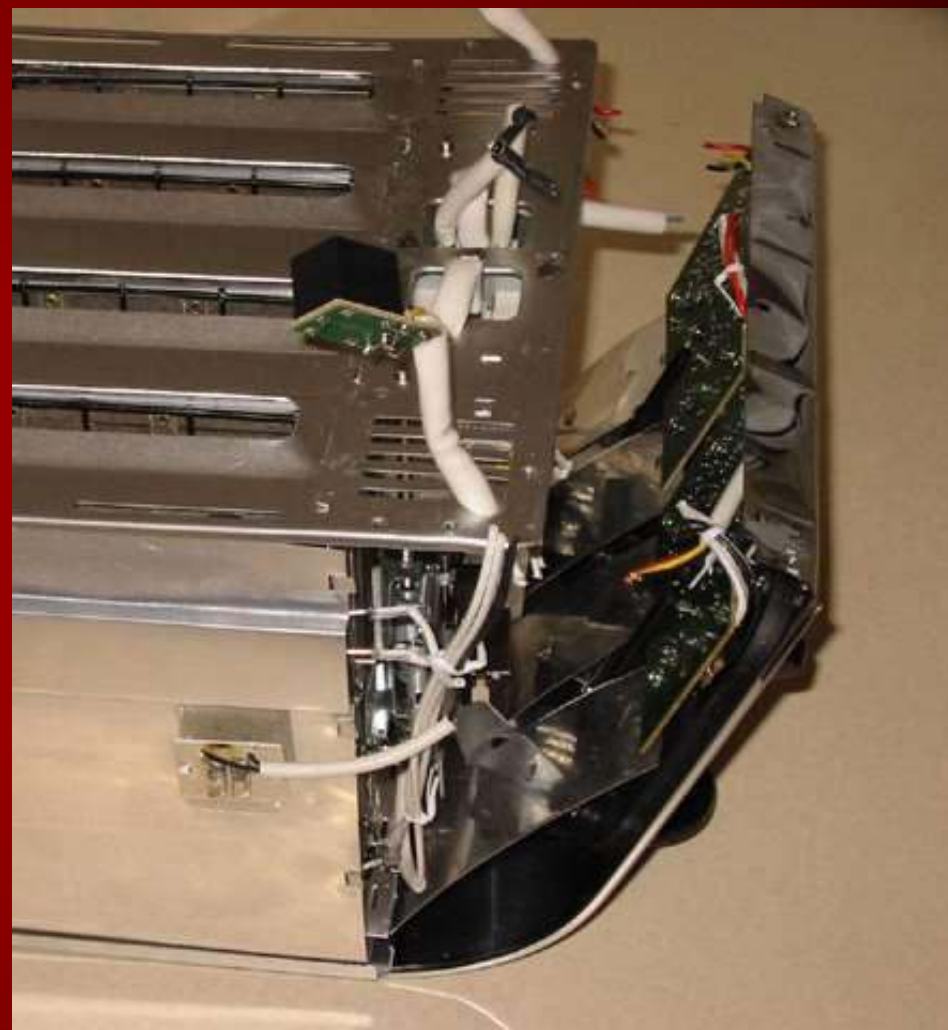
Curtin University is combining video data with operational data to better understand campus operations and building utilisation, which has become a major part of Curtin's smart campus initiative, said Curtin chief operating officer, Ian Callahan. Curtin has more than 60,000 students and 4,000 staff.

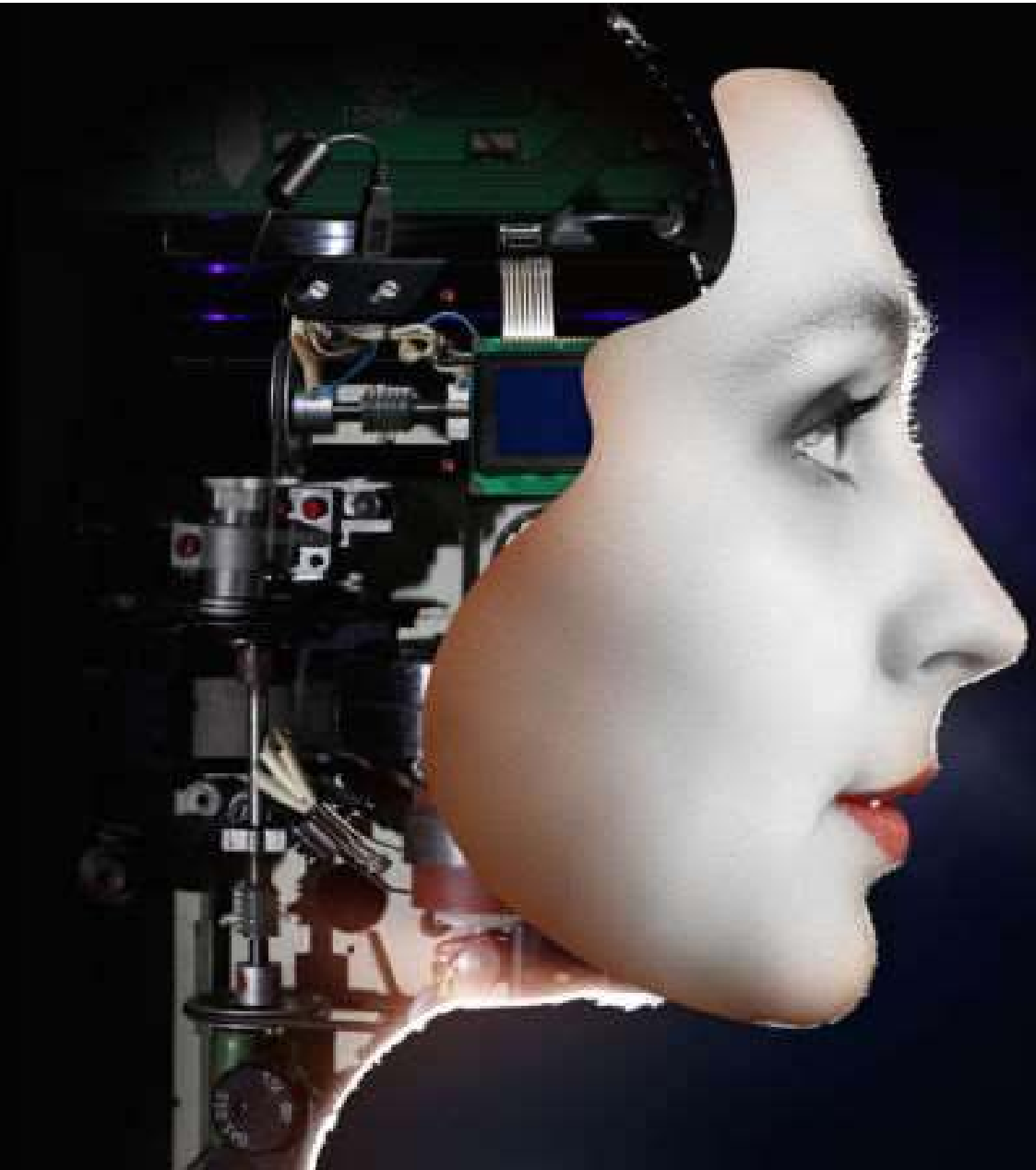
The university is integrating data visualization, video analytics, and live face matching technologies in a single analytics dashboard that provides the real-time knowledge the university needs to make decisions about classes, operations, and future requirements.

Editor's Recommendation

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- When will the IT project madness end?
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- Regaining trust after a digital government failure
- Tech dreams come true: Origin's Kelly Ferguson reveals personal journey







Knowledge comes from learning

Wisdom comes from living

Multi-cloud
strategies

WHO IS YOUR CUSTOMER?

Azure backup
and its
adoption

Smart campus
through video,
IoT and AI

CURIOSITY AND TINKERING PROVIDE DEEP
LEARNING EXPERIENCES

KNOWLEDGE COMES FROM LEARNING
WISDOM COMES FROM LIVING

Artificial
Intelligence
for
cybersecurity

GPU-enabled
remote
desktops

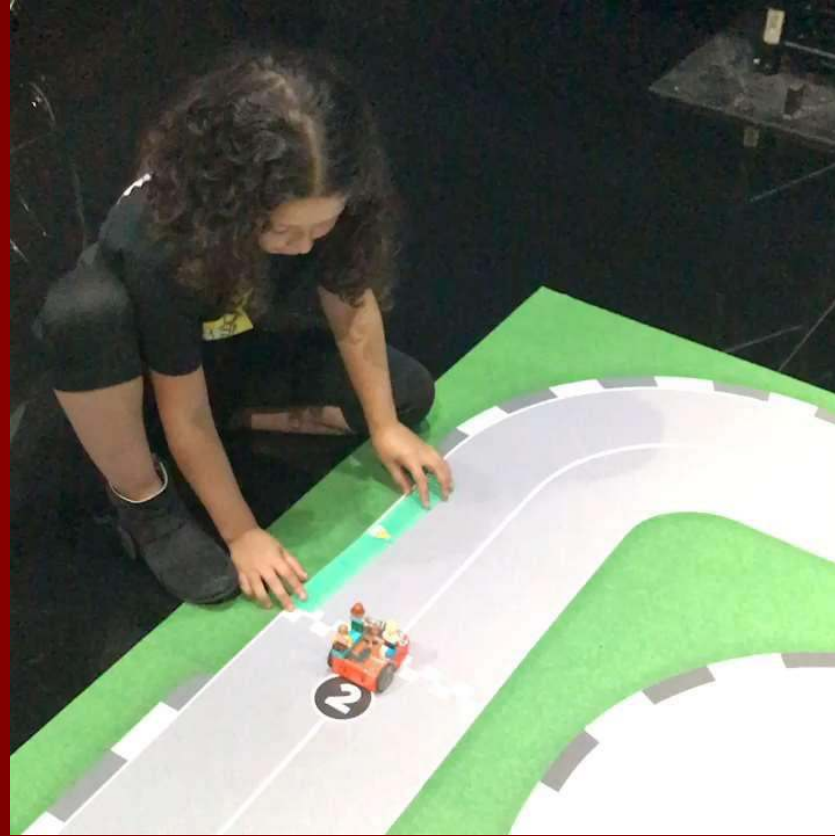
YOU CAN'T CONTROL WHAT OTHER PEOPLE DO
WITH YOUR TECHNOLOGY

Multifactor
Authentication











Re-Wire For Our Future (but don't forget the donut)

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