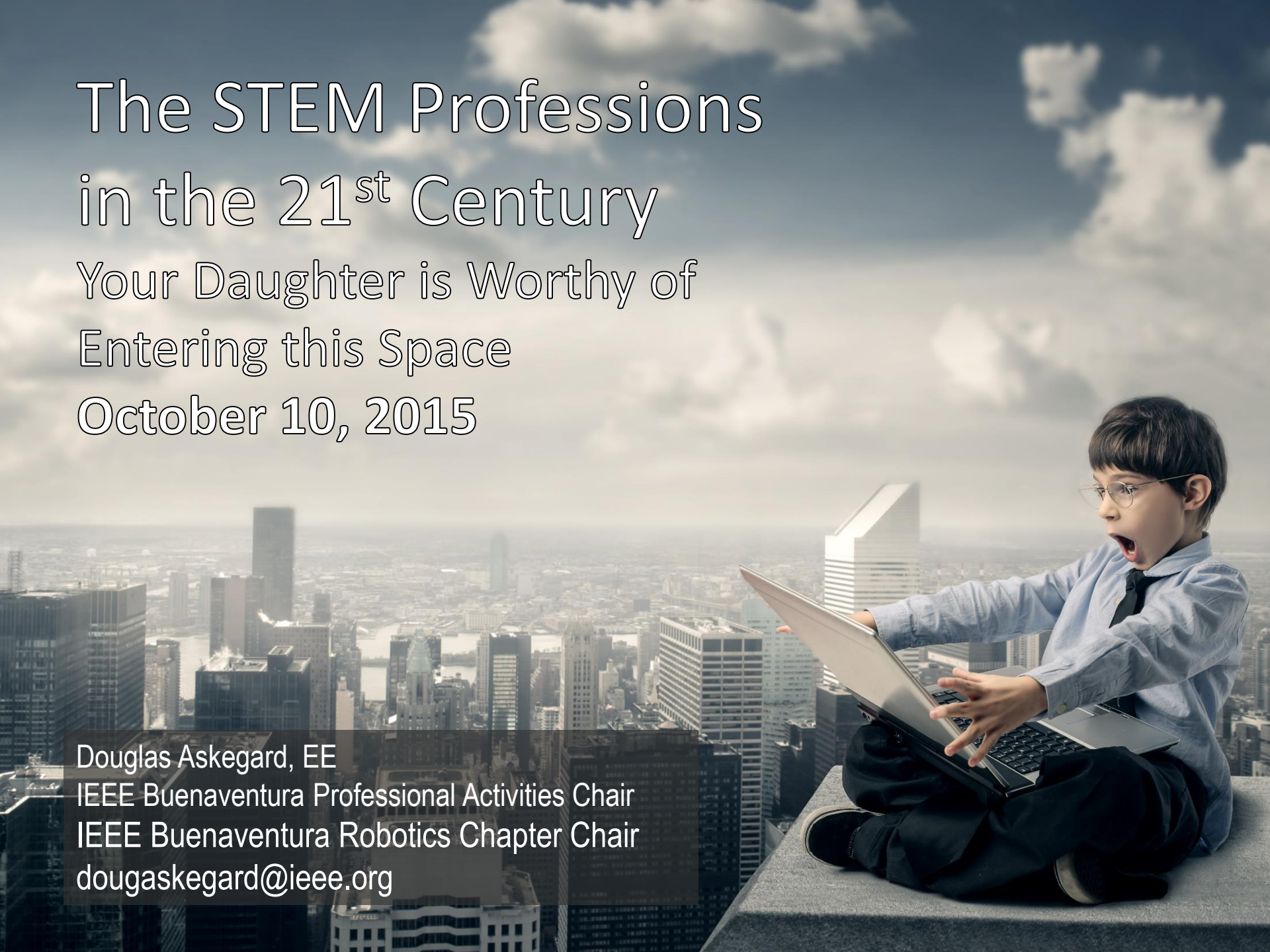
The STEM Professions in the 21st Century

Your Daughter is Worthy of Entering this Space

October 10, 2015



Douglas Askegard, EE
IEEE Buenaventura Professional Activities Chair
IEEE Buenaventura Robotics Chapter Chair
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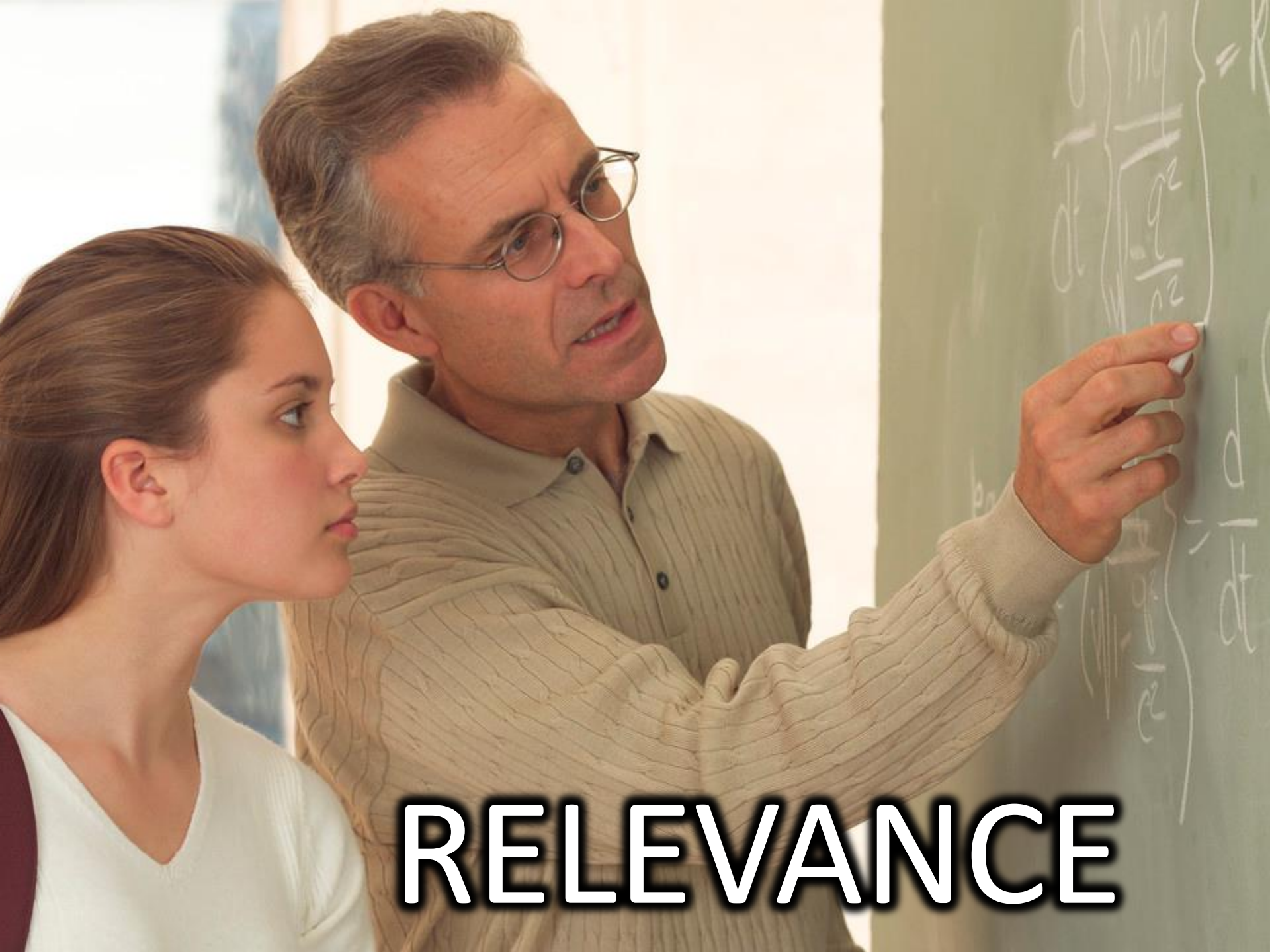
RELEVANCE


RELEVANCE

RELEVANCE

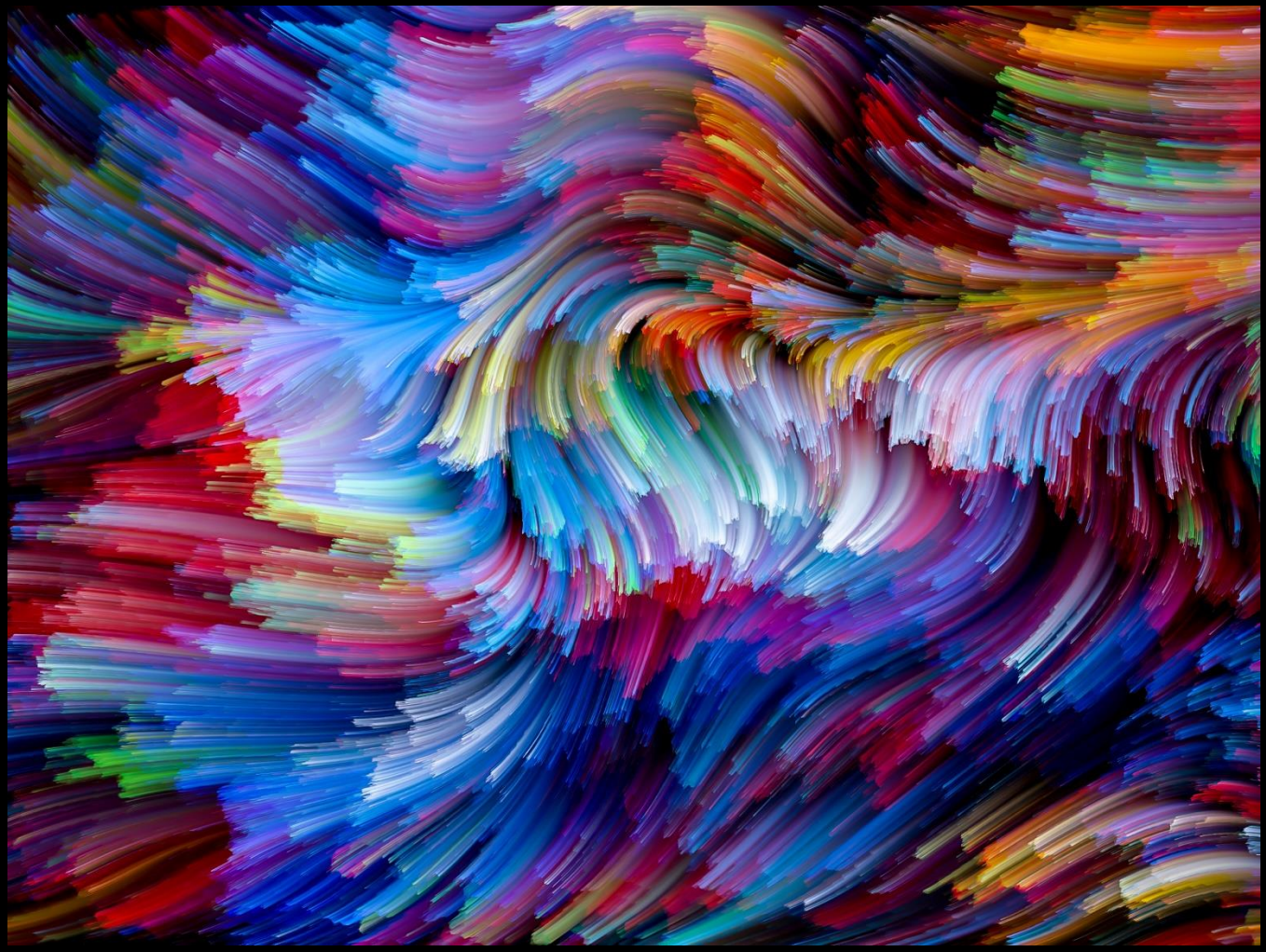
LEVERAGES
THE WORK OF MANY

RELEVANCE

RELEVANCE

CONTINUOUSLY LEARNING

RELEVANCE



BLENDS MULTIPLE FIELDS OF KNOWLEDGE

YES TO

COLLEGE EDUCATION

BUT

RELEVANCE IS A MUST

STEM IS ESSENTIAL

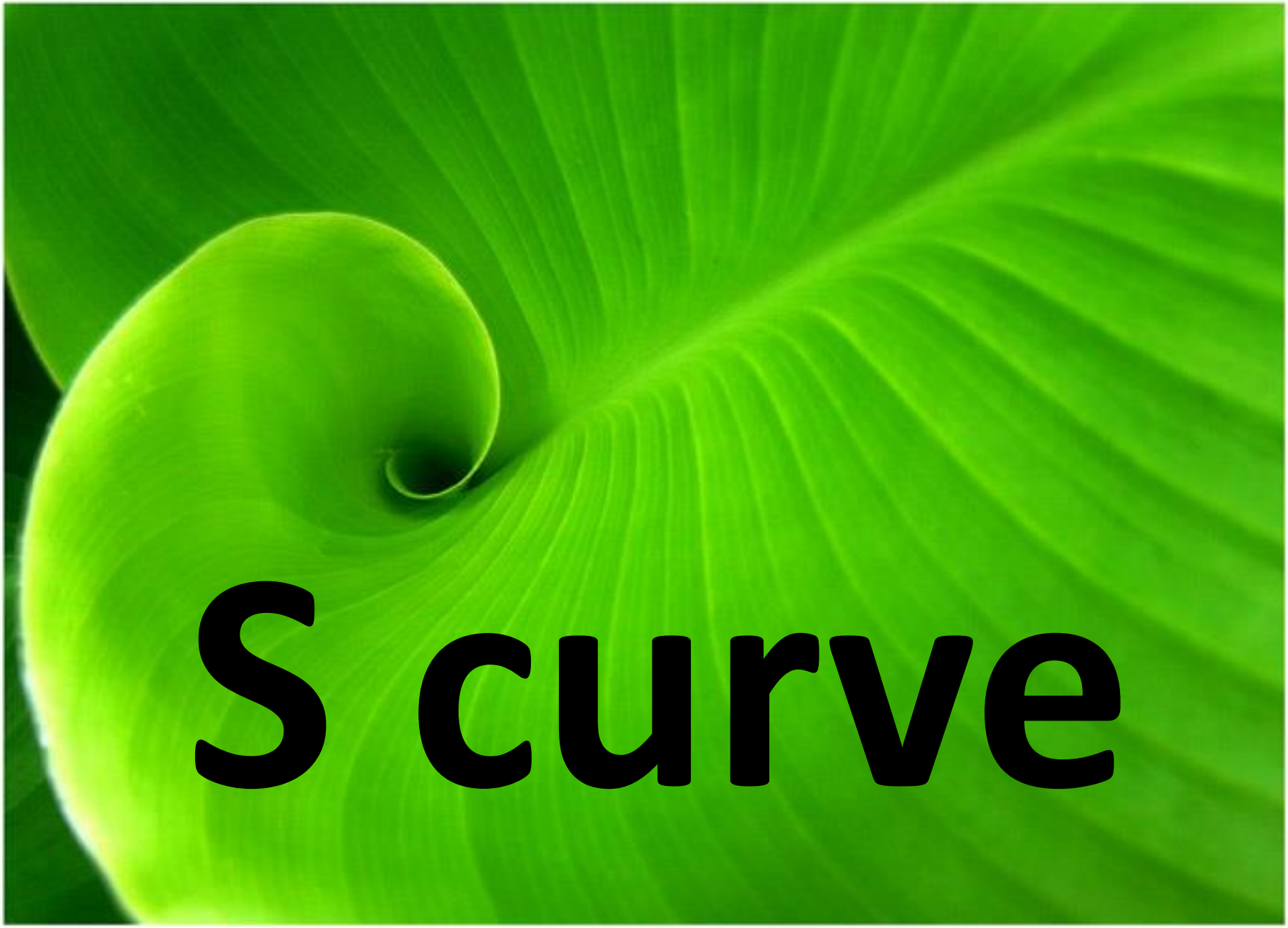
TO RELEVANCE

SCIENCE

TECHNOLOGY

ENGINEERING

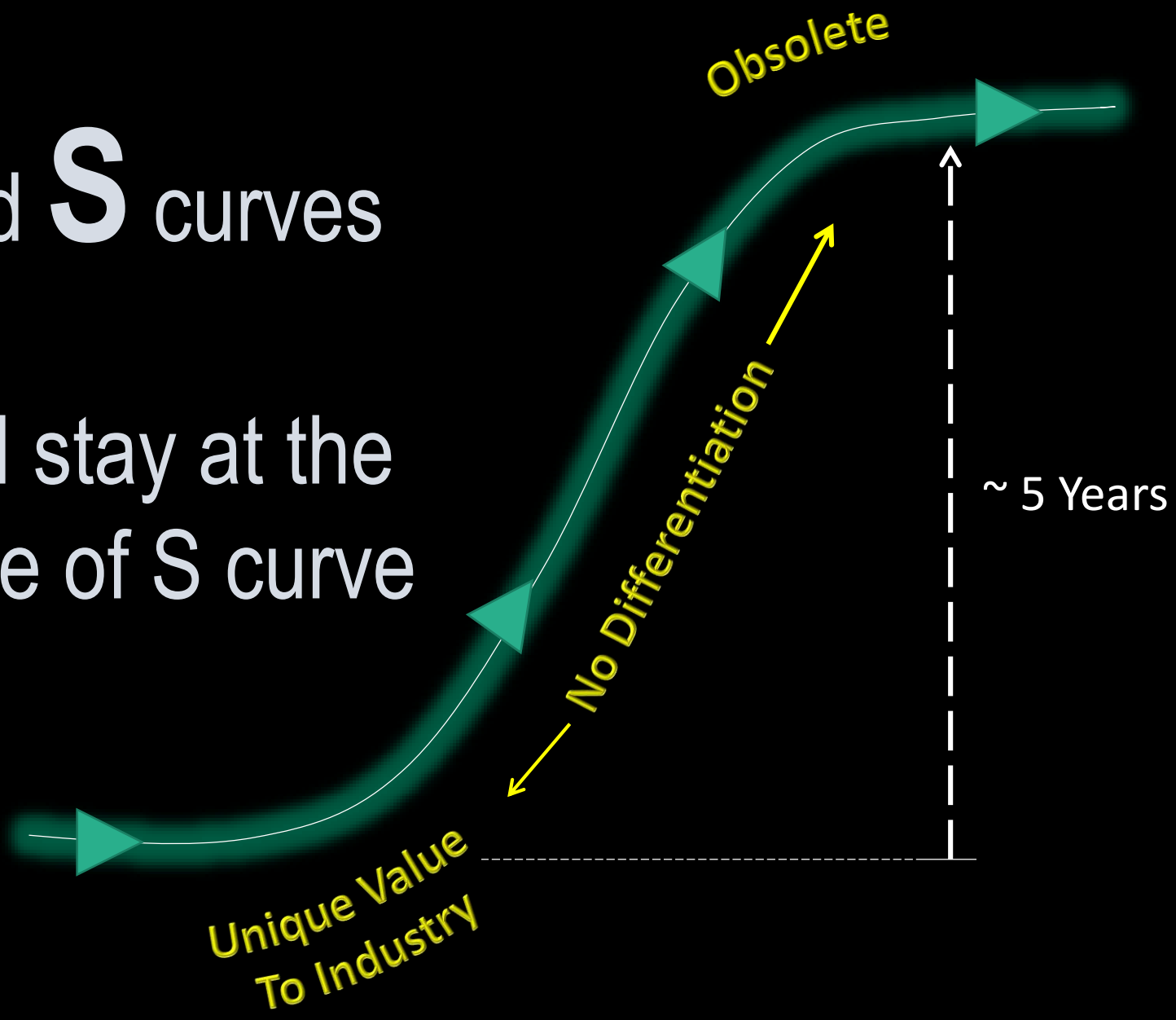
MATHEMATICS


S curve

PROFESSIONAL ADVANCEMENT

Find **S** curves

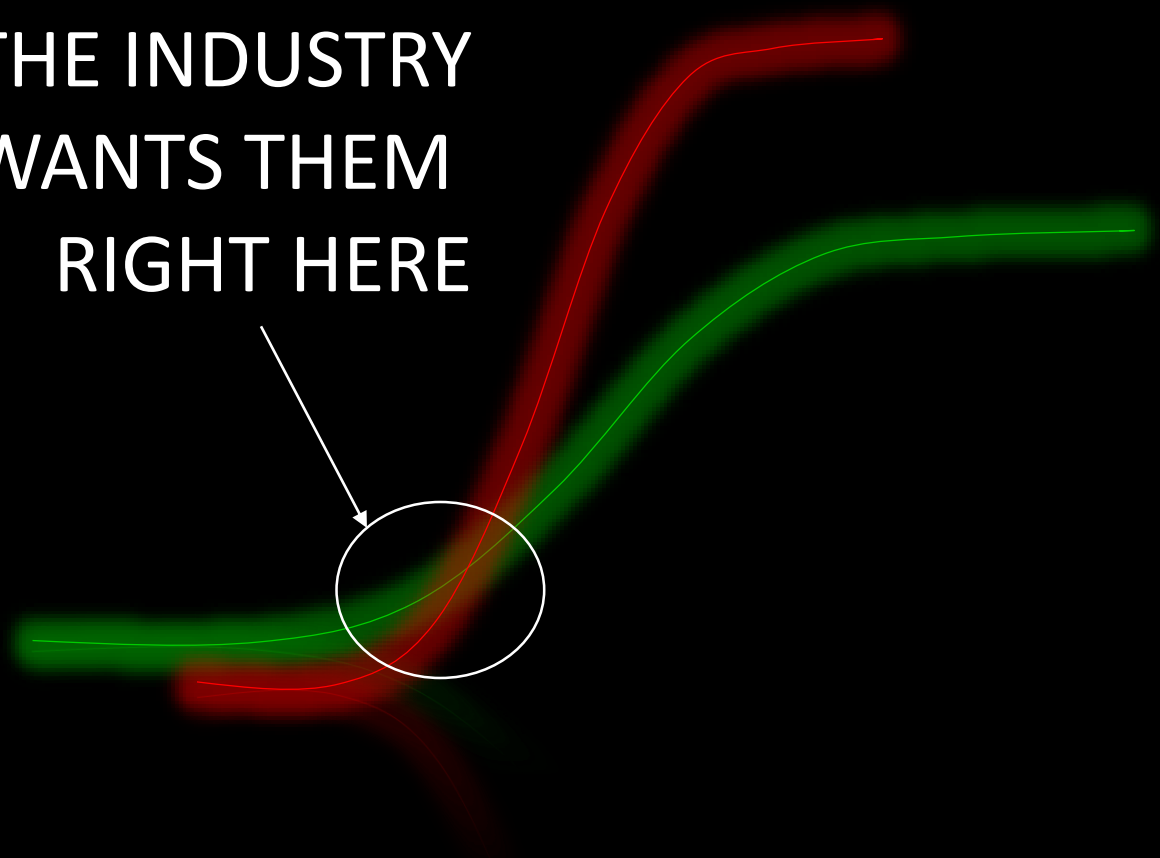
And stay at the knee of S curve



2015 AND BEYOND

WE NEED TO INSPIRE YOUR DAUGHTERS TO LOOK FOR CONVERGENCE OF "S CURVES"

THE INDUSTRY WANTS THEM RIGHT HERE



DEPARTURE
FOR THE 21ST CENTURY JOBS

S Curves in
HEALTHCARE

“Elderly Woman”: Dominant Healthcare Customer
DEVELOPED COUNTRIES

“The Youth”: Dominant Healthcare Focus
DEVELOPING COUNTRIES

EPISODIC TREATMENT ARE THE PAST

PREDICTIVE MEDICINE

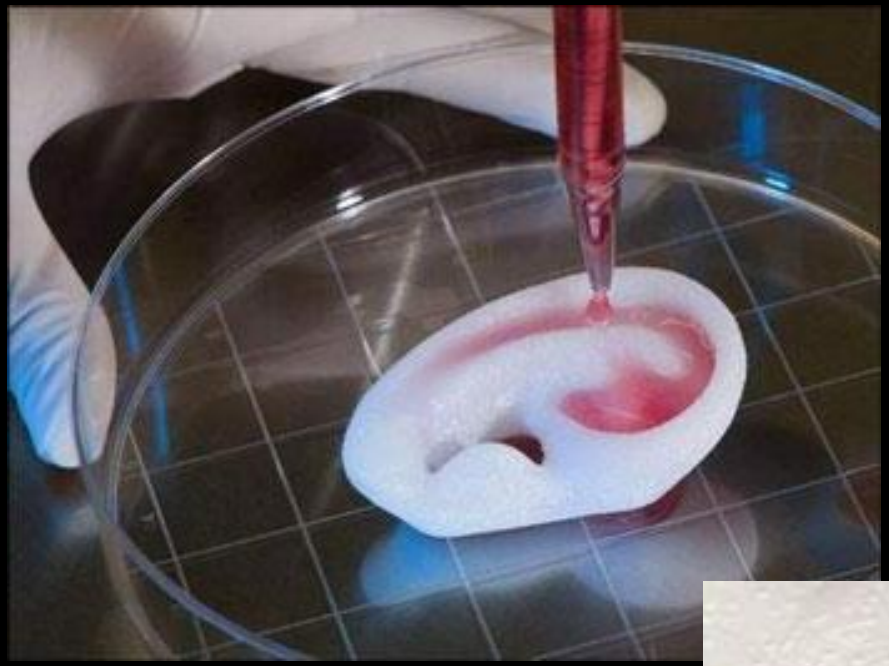
PREVENTIVE MEDICINE

PERSONALIZED MEDICINE

PRINTED MEDICINE

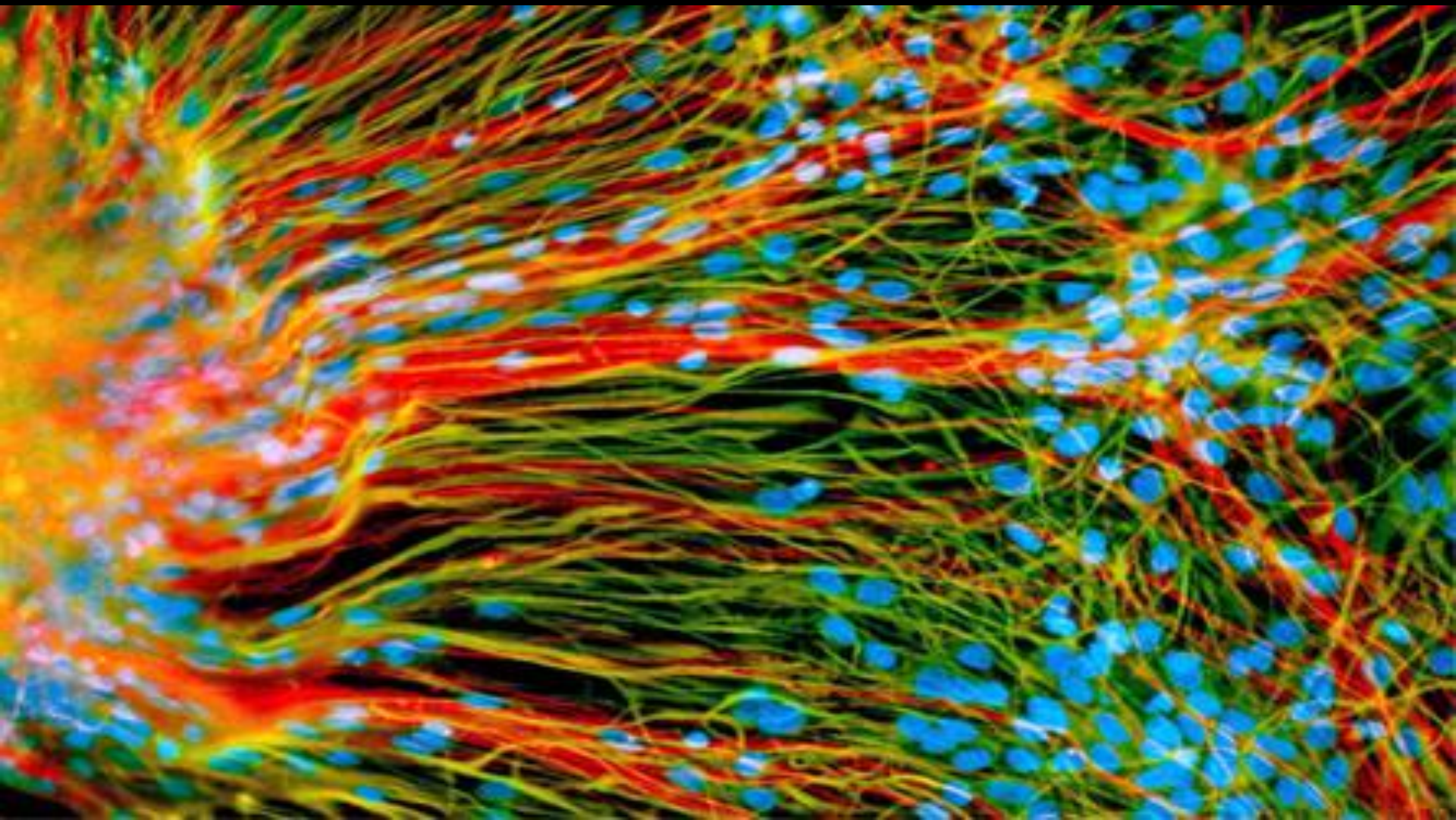
PRINTED HUMAN SKIN

PRINTED HUMAN ORGANS

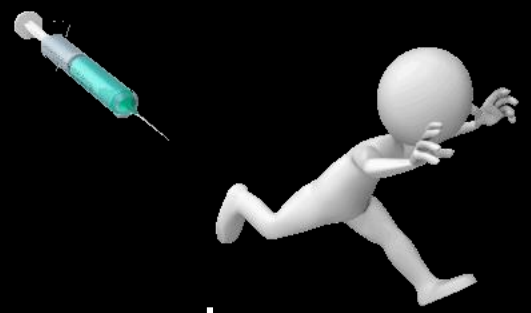


Fields of the Small
Nanotechnology, Biotechnology

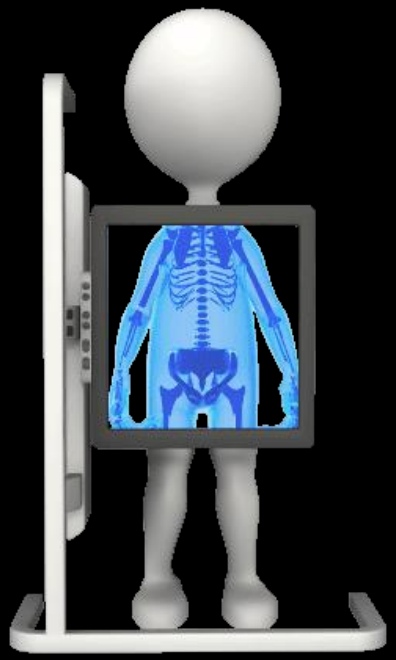
Stem Cells



Medical Revolutions in the Making



Improved
Treatment Delivery



Imaging

Telemedicine

New Jobs that Did not Exist Before

Disease Predictor or Gene Analyst
Disease Prevention Strategist
Medical Test Developer
Immunology and Vaccine Expert
Medical Data Management Specialist
Ethics and Legal Expert

FACE RECOGNITION - SECURITY

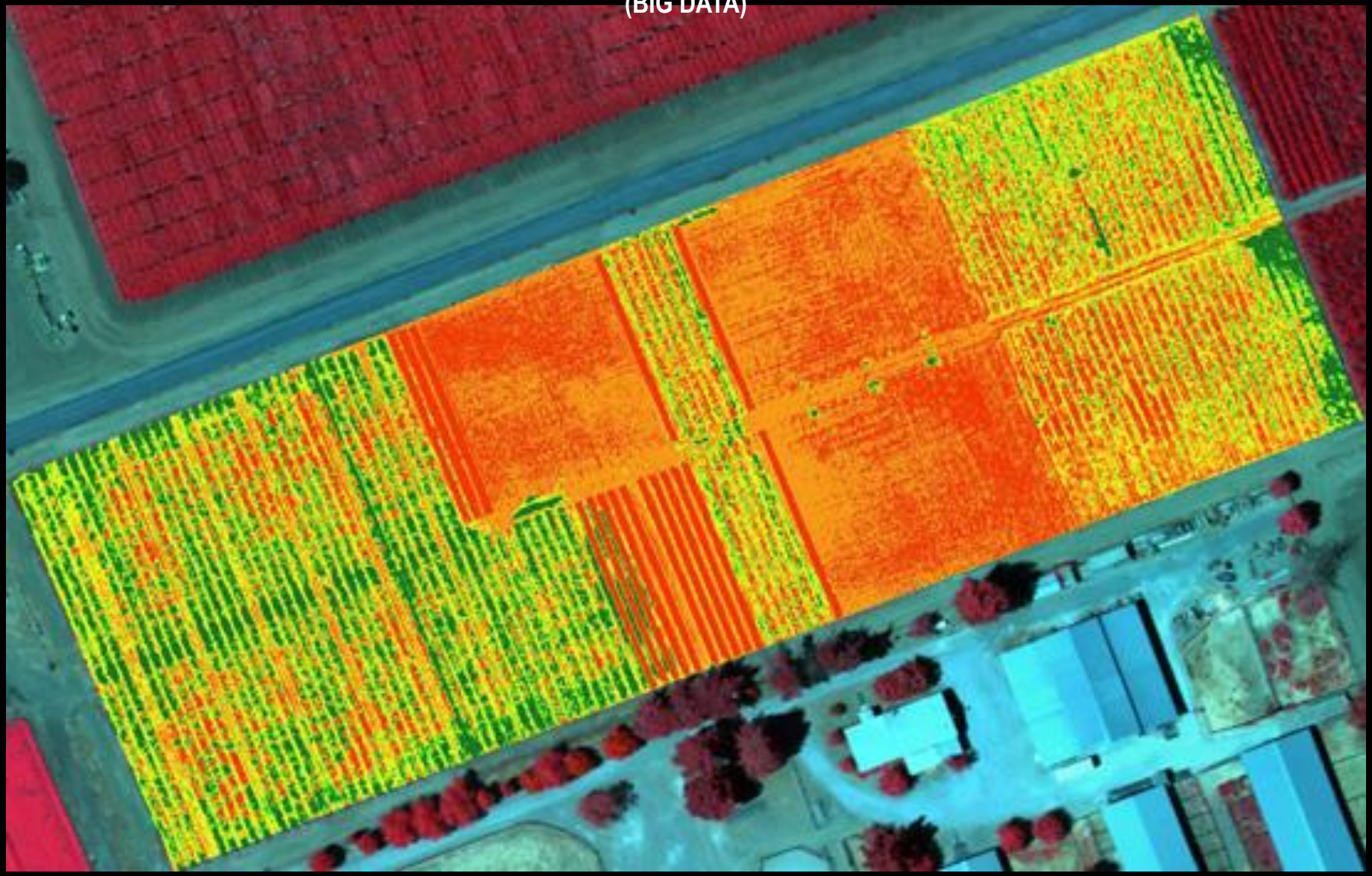
(BIG DATA)

NEURO-MARKETING

(BIG DATA)

PRECISION AGRICULTURE (DRONE)

(BIG DATA)



Reference: Modern Farmer

FROM PHOTO TO DATA INFORMATION

(BIG DATA)

Search Engines

Google Glass

Medicine

Security

New Jobs that Did not Exist Before

Data Scientist: deep analyst of digital information
Data Architect: expert at organizing “messy” data
Data Visualizer: translator into easy summaries
Pattern Analyst: analyst of common properties
Algorithm Developer: converter of chaos into mathematical equations

VIRTUAL REALITY

New Jobs That Did Not Exist Before

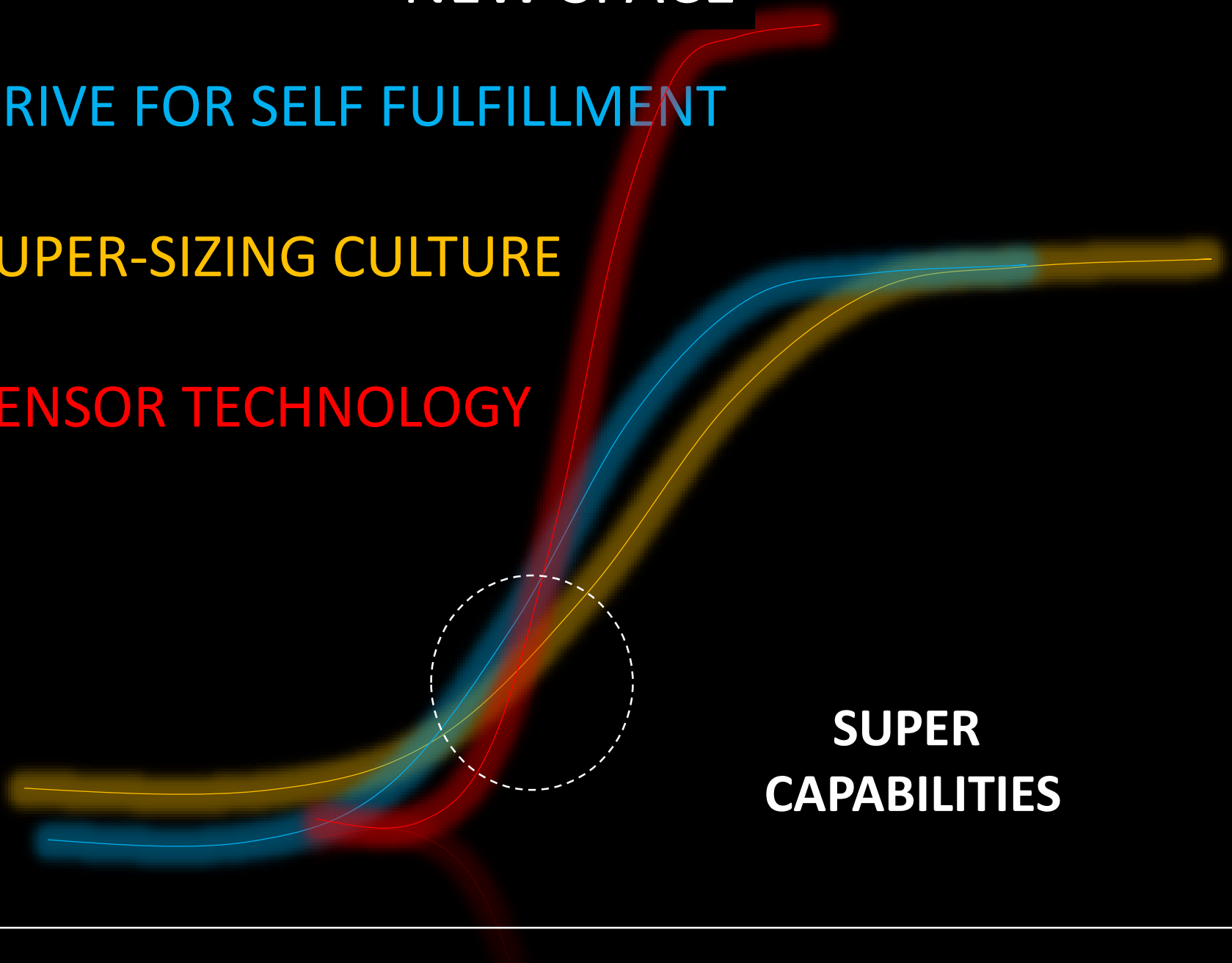
Immersive Technologist
Technical Artist
Technical Acting Specialist
Digital Human Rendition Specialist
Human-Avatar Behavior Translator
Immersive Environment Educator

NEW SPACE

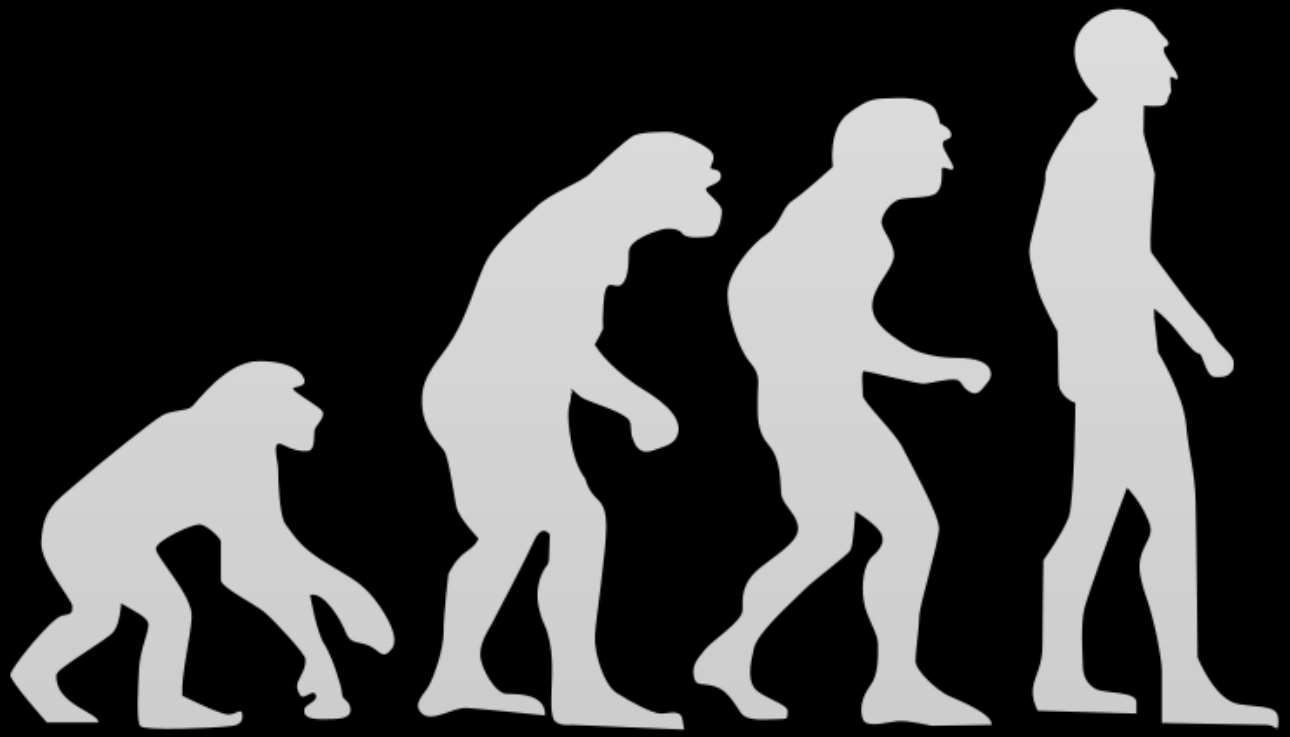
DRIVE FOR SELF FULFILLMENT

SUPER-SIZING CULTURE

SENSOR TECHNOLOGY



SUPER CAPABILITIES



AUGMENTING HUMAN PHYSICAL CAPABILITIES
EXOSKELETON ROBOTS

Raytheon XOX2
can lift 50 pounds per arm

Lockheed Martin HULC

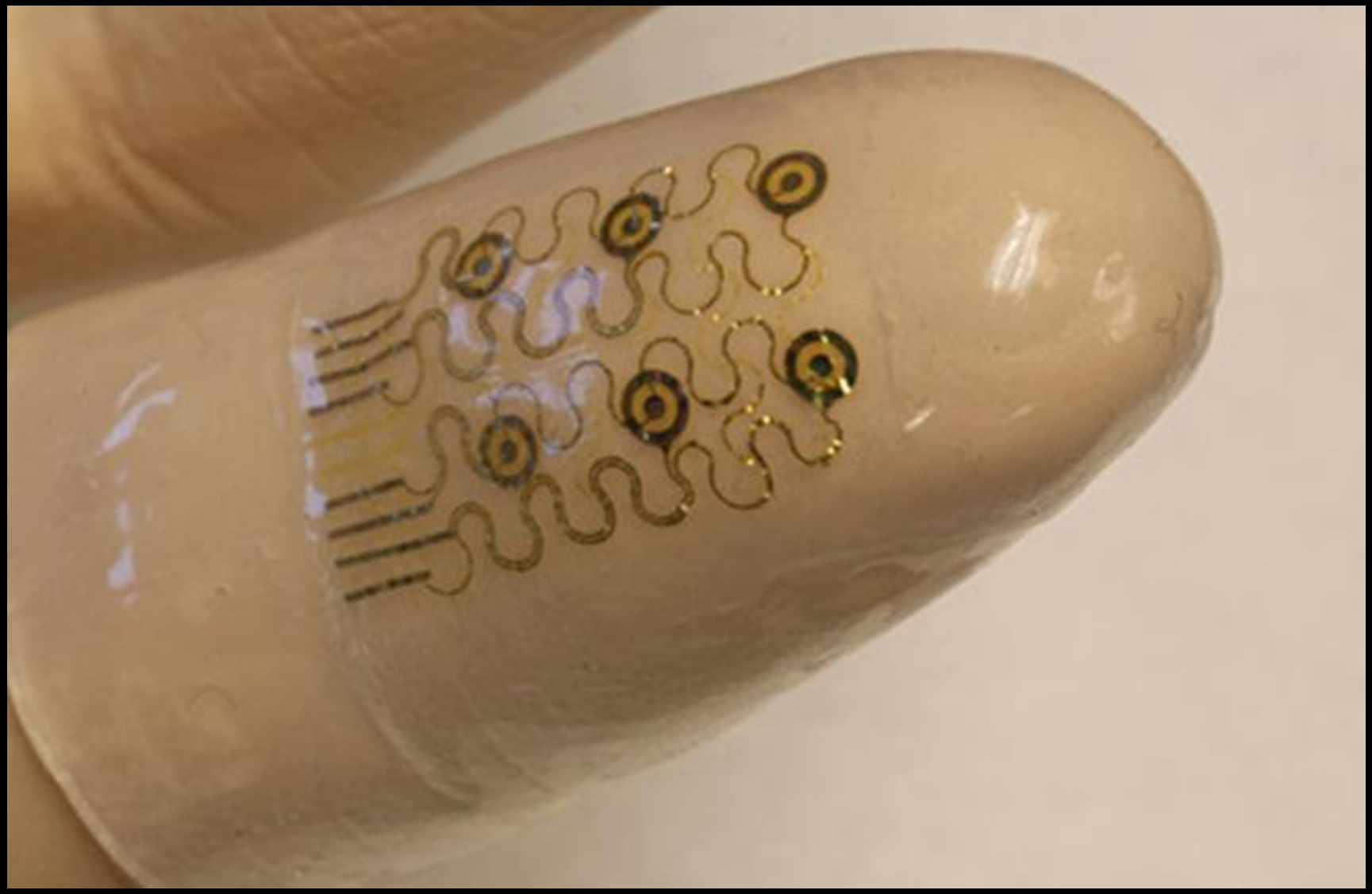
AUGMENTED HUMAN PHYSICAL CAPABILITIES EXOSKELETON ROBOTS

Bionics
eLEGS

Huazhong University of Science and Technology, Wuhan, China

AUGMENTED PERCEPTION

AUGMENTED TOUCH



http://www.kurzweilai.net/smart-fingertips-could-allow-for-virtual-surgery

AUGMENTED TASTE = PSEUDO-GUSTATION

Meta Cookie

AUGMENTED EMOTIONS

Sensory Fiction by MIT's Media Lab

AUGMENTED AUTONOMY

2015 Google car

New Jobs That Did Not Exist Before

Developer of Super Human Capabilities

Assistive Robot Designer

Robot Training Assistant

Sensor-Body Interface Technologist

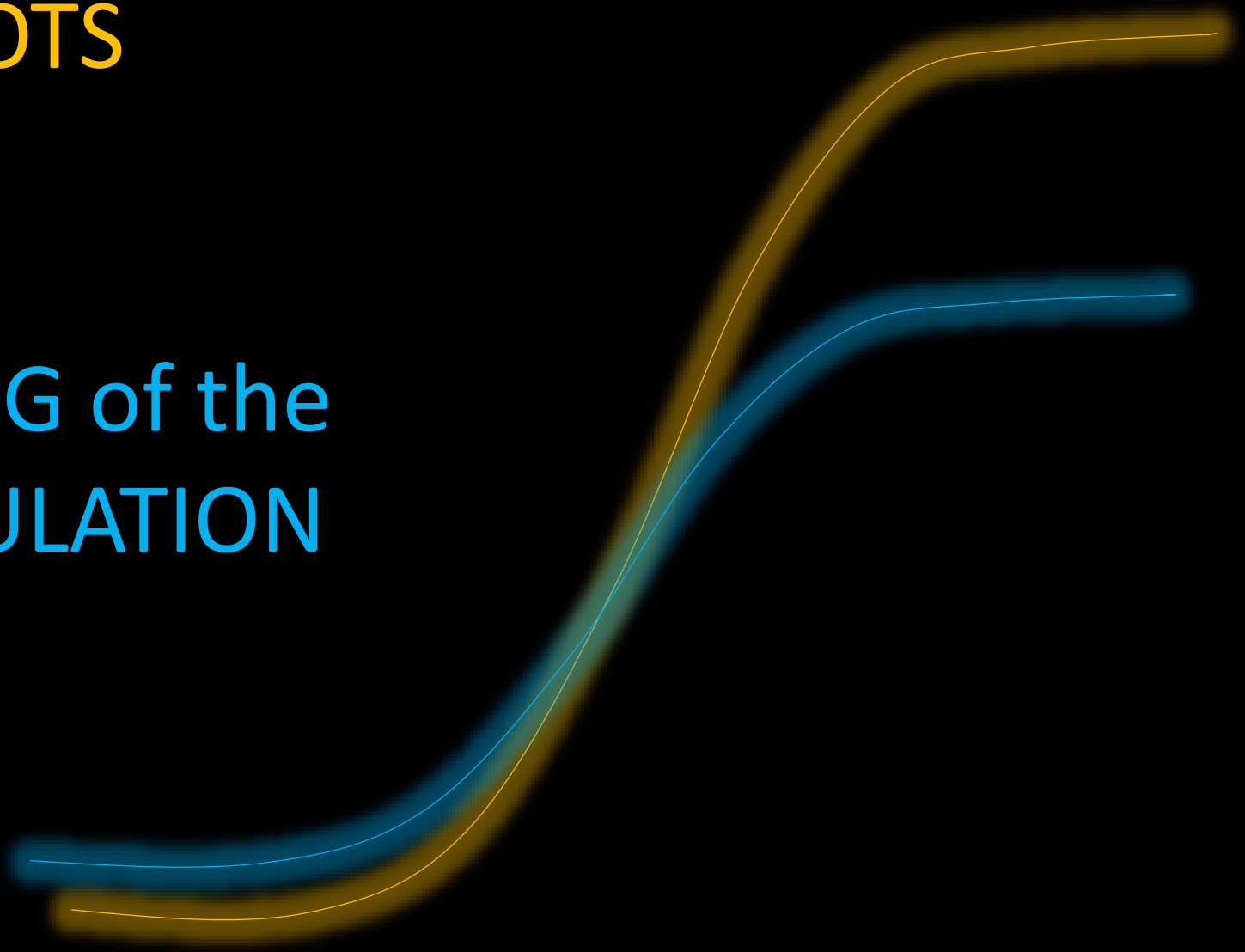
Smart Surface Application Technician

Graphics: http://www.dailygalaxy.com/photos/uncategorized/2008/01/10/robots_4_2.jpg

NEW SPACE

ROBOTS

AGING of the POPULATION



Retail Assistant (Kyoto, Japan)

Home Assistant Robot (Tokyo U.)

Reference:
http://phys.org/news180261433.html#jCp

Kaspar Robot
(U. of Hertfordshire, UK)

Kinesics and Synchronization in Personal Assistant Robotics

teaches social interactions and physical contacts to autistic children teaches social interactions and physical contacts to autistic children

Nao
(U. of Connecticut)

Reference: U. of Connecticut, http://today.uconn.edu/blog/2010/08/robot-speaks-the-language-of-kids/

ARTIFICIAL INTELLIGENCE

MACHINE LEARNING
A LARGE GAP TO DEVELOP

MAKING COOKIES

MIT

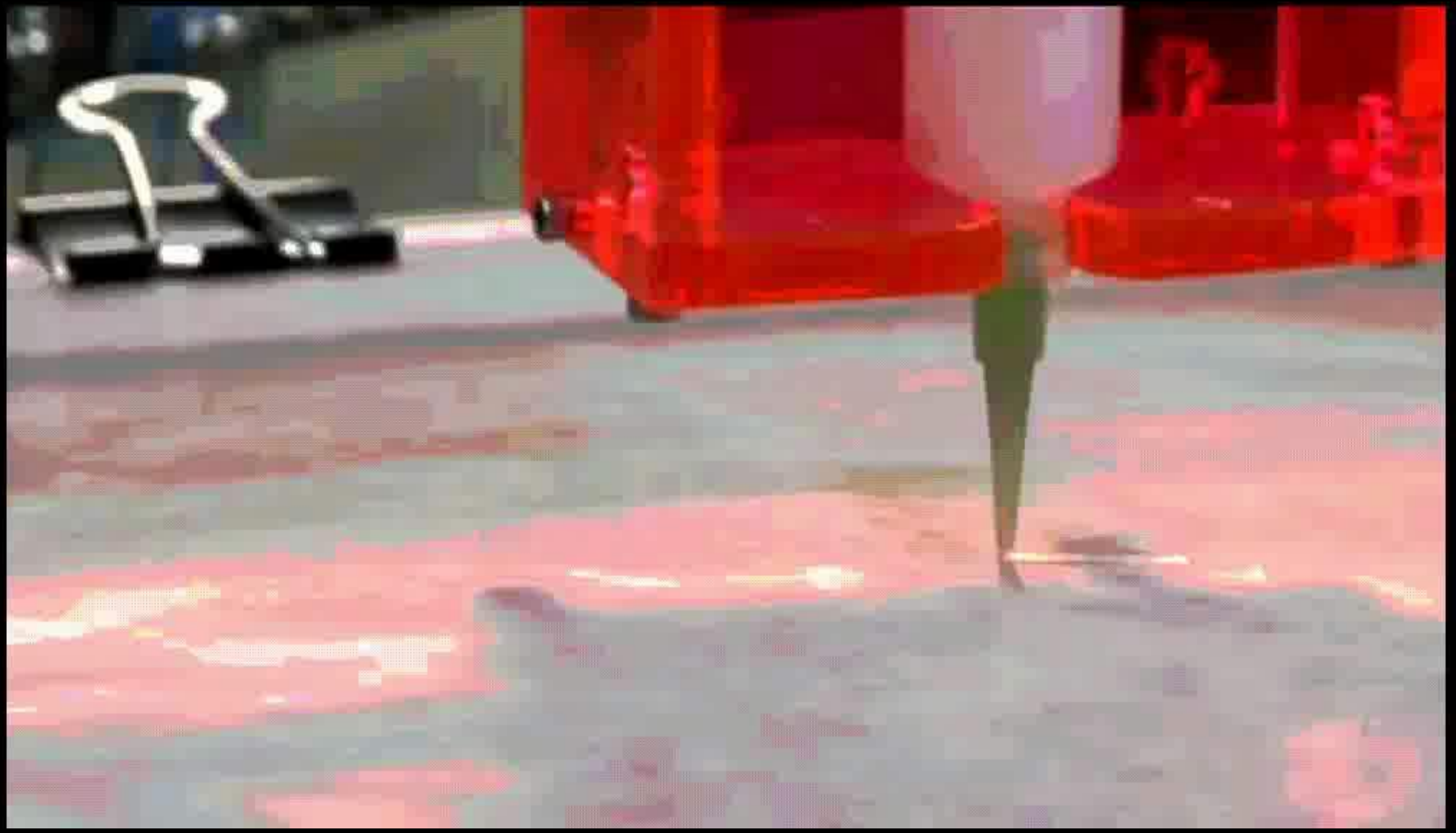
FLIPPING PANCAKES

Italian Institute of Technology
WAM arm from Barrett Technology

New Jobs That Did Not Exist Before

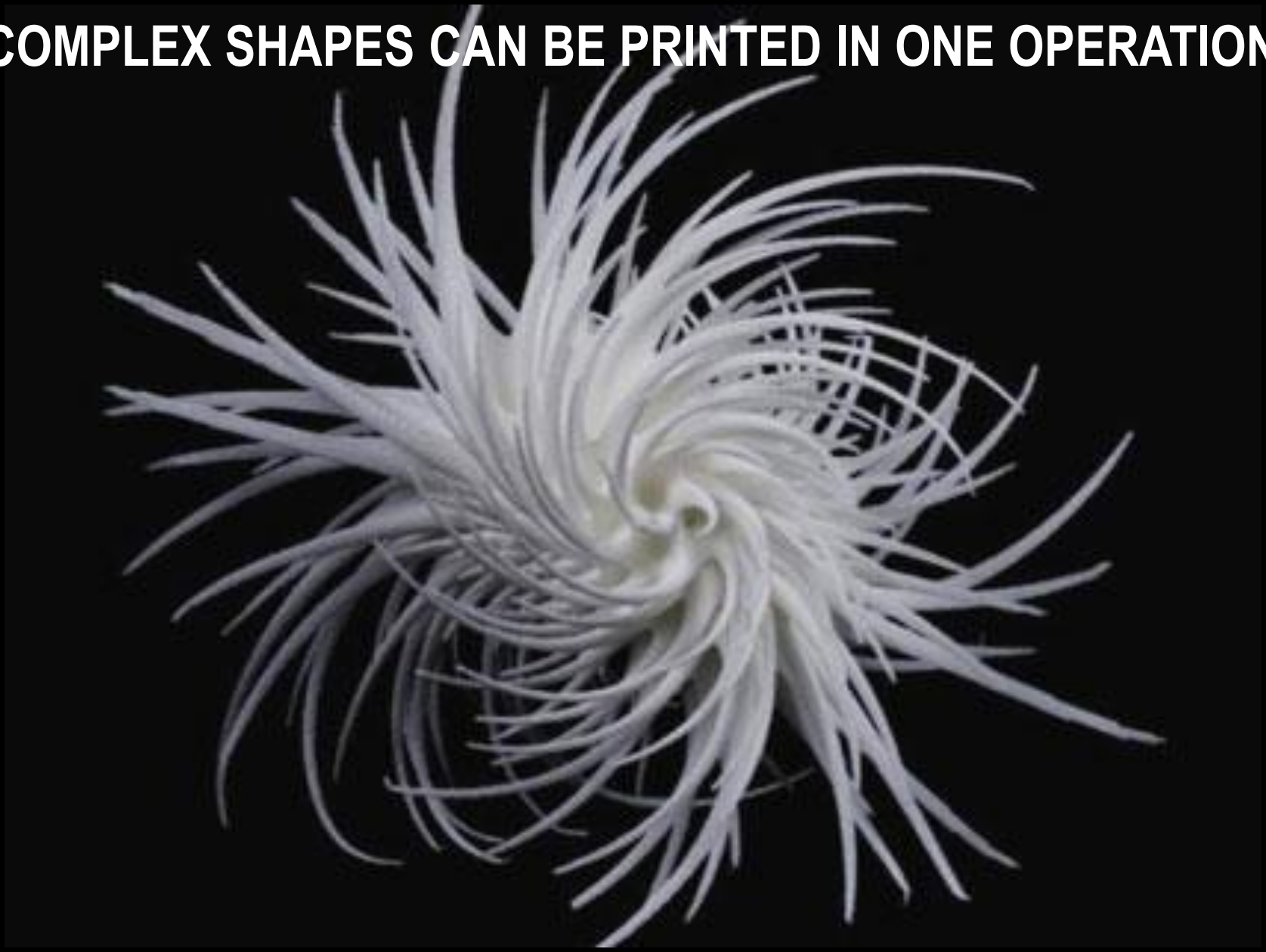
Geronto- EE Engineer
Artificial Intelligence Engineer
Robot Adapter Technician
Robot Ordering Consultant

Psychology Law



http://www.popularmechanics.com/technology/gadgets/news/4224759?series=37

COMPLEX SHAPES CAN BE PRINTED IN ONE OPERATION



SPRINGS AND INTERLOCKING WHEELS CAN BE PRINTED

New Jobs that Did Not Exist Before

Replicator Specialist
3D Creation Designer
3D Printing Material Developer
Fluid Deposition Expert

CIRCLING BACK TO OUR MISSION

Guide your daughters onto emerging S Curves

THEIR FUTURE JOBS ARE
AT THE CONVERGENCE OF
2 OR MORE S CURVES

SHOW THEM HOW TO MANAGE THEIR DIGITAL FOOTPRINT WISELY

AN IMAGE THAT IS POSITIVE, PROFESSIONAL & FOCUSED ON THE “S CURVES”

You can contact me at dougaskegard@ieee.org