IFIP IP3 Briefing on "Artificial Intelligence (AI) Trends" Session: Cybersecurity in the age of AI

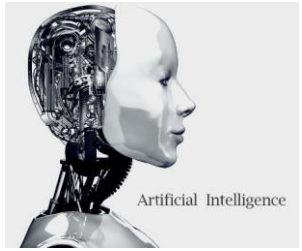
June 15, 2017
UN ITU Headquarters, Geneva
1630–1815 Popov Room 2, ITU Tower

AI Digital Quake

10 MSs' → $5 T market cap

China $337B

Mobile/Cloud first → AI first



WORLD ECONOMIC FORUM

AI top 6 trends

Gartner "perceptual smart machine age" top 3 trends

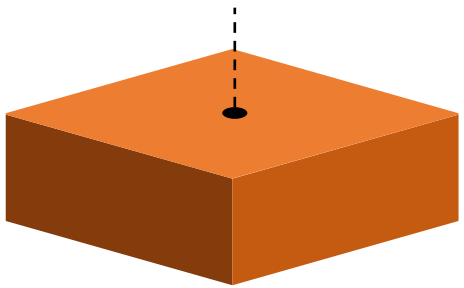
AI tools, hardware, open source (OpenAI)

FSR summit, $92.7 Trillion, AI key

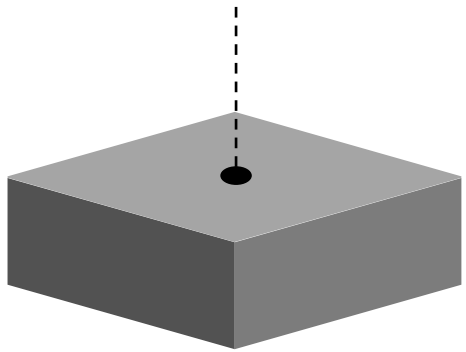
Data volumes driving AI

Only AI has the power to analyze this data to solve grand challenges and problems guiding our future.

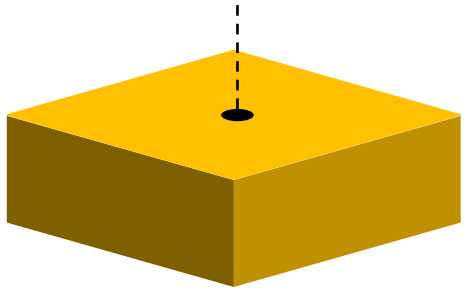
44 ZB 2020, 50x 2010



2015/16 entire human history



26 billion IoT devices 2020

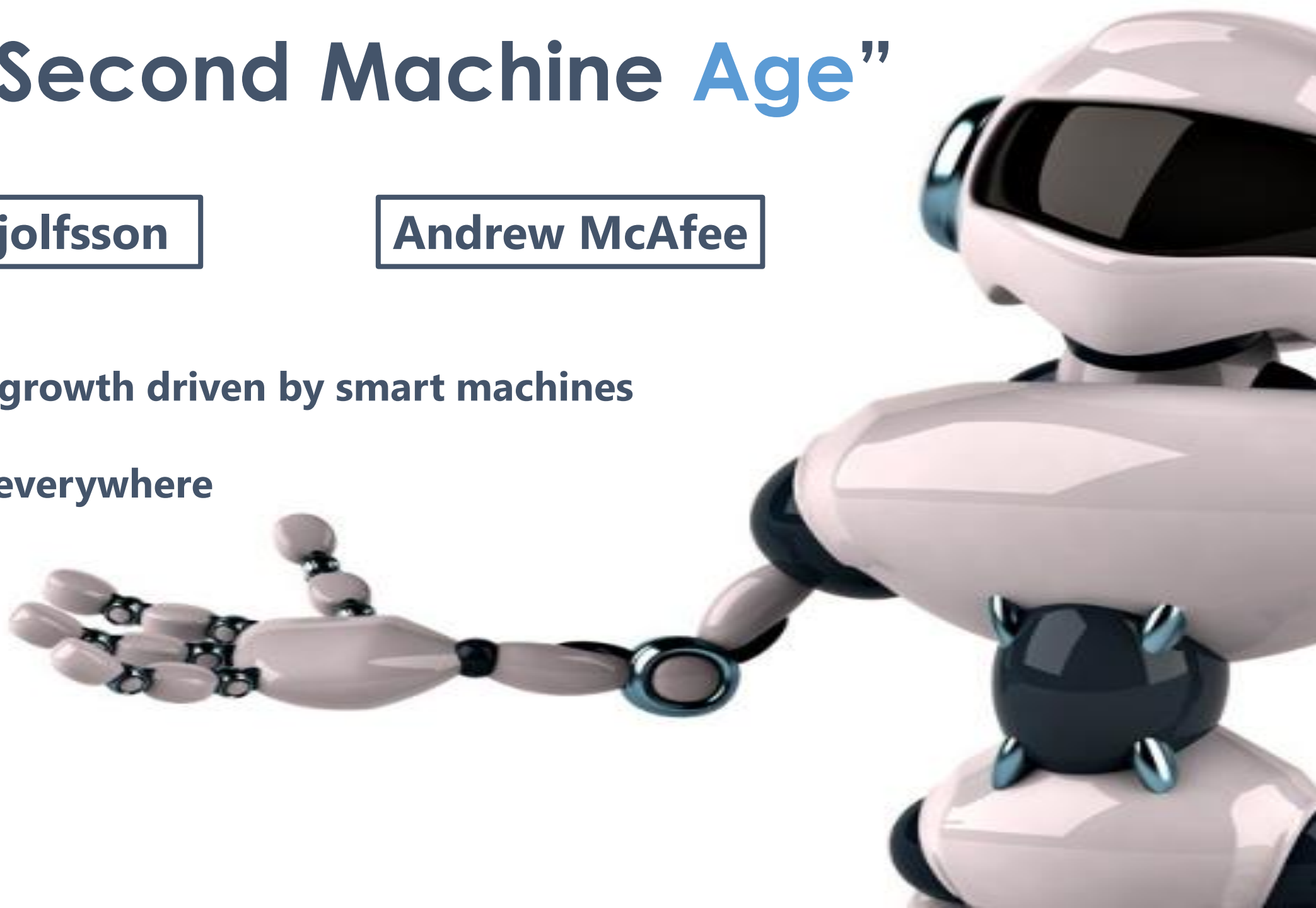


“Second Machine Age”

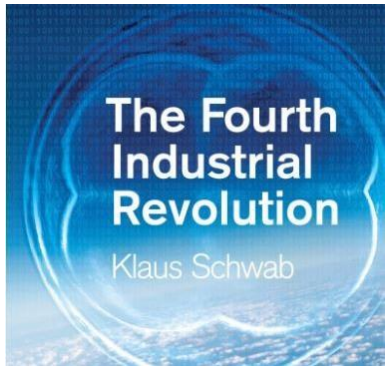
Erik Brynjolfsson

Andrew McAfee

- ❑ **Dramatic growth driven by smart machines**
- ❑ **Evidence everywhere**

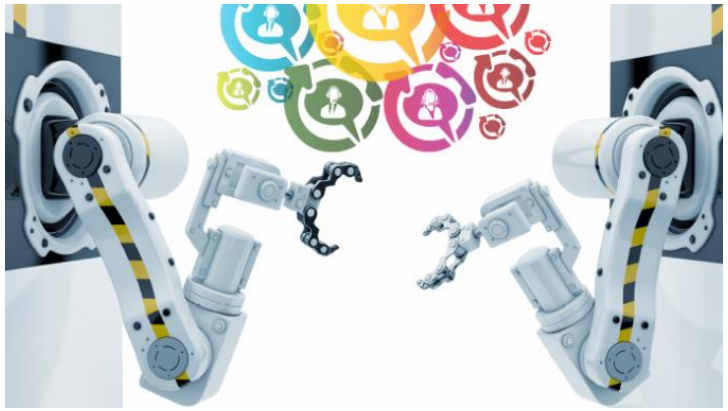


4th Industrial Revolution



The Fourth Industrial Revolution
by Prof Klaus Schwab World Economic Forum;
Subject UBS paper

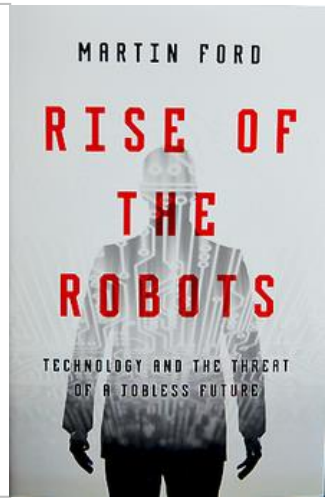
EXTREME automation, connectivity



Cyber–physical systems driven by AI and robots

AI Impact

Martin Ford,
Rise of
the Robots



AoE: AI of Everything

Is AI creating a digital quake where > 80 percent of companies and jobs will need to change or fail?

What are the implications to society, economic development, and path to prosperity?

AI technical standards achieve SDGs?

AI Driven Unprecedented Era

Hyper time compression

new disruptive innovations

Extreme convergence

of multiple domains

Exponential accelerating automation

– smart sensors and the 26 billion IoT devices by 2020

(11 trillion USD by 2025)

Universal connectivity linked by a digital AI mesh

AI Driven Unprecedented Era

AI of Everything (AoE)–the global AI mesh spawning a Digital Quake driving the Knowledge Synthesis of Everything (KSE), an inflection point for humankind and the SDGs.

AoE: Evidence

Singapore self-driving Taxis
September 2016

Telefonica, BigML AI
selects startups

Norwegian Telenor AI
and Big Data Lab

Deep Knowledge Ventures,
AI votes on investments

Baidu, StockMaster
predicts market trends

Baidu, AskADoctor,
520 diseases, refers specialists

GE survival on software and AI

Controversy: AI bias

United Nations Sustainable Development Goals (SDGs): affordable, reliable, everywhere, safe, inclusive, fair, equal, resilient, sustainable, all ages

WSIS 11 Action Lines

AI

UN 8 MDGs 2000–2015

UN 17 SDGs 2015–2030

AI's contributions to SDGs
1 NO POVERTY
Map poverty with predictive Big Data analytics
2 ZERO HUNGER
Increase agricultural productivity
3 GOOD HEALTH AND WELL-BEING
Analyse vast amounts of healthcare data
4 QUALITY EDUCATION
Revolutionize classrooms with individualized learning
5 GENDER EQUALITY
Pinpoint gender inequity, drive balanced hiring
6 CLEAN WATER AND SANITATION
Improve efficient, clean water provision
7 AFFORDABLE AND CLEAN ENERGY
Improve photovoltaic energy capture
8 DECENT WORK AND ECONOMIC GROWTH
Increase productivity through intelligent automation
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
Help drive industry innovation
10 REDUCED INEQUALITIES
Build a more inclusive society (e.g. disability robotics)
11 SUSTAINABLE CITIES AND COMMUNITIES
Power urban-planning decisions through sensor data
12 RESPONSIBLE CONSUMPTION AND PRODUCTION
Predict optimal production levels to reduce waste
13 CLIMATE ACTION
Model climate change to predict disasters
14 LIFE BELOW WATER
Track illegal fishing through pattern-recognition software
15 LIFE ON LAND
Outwit poachers and monitor species' health
16 PEACE, JUSTICE AND STRONG INSTITUTIONS
Reduce discrimination and corruption in government
17 PARTNERSHIPS FOR THE GOALS
Multi-sectoral collaboration is essential

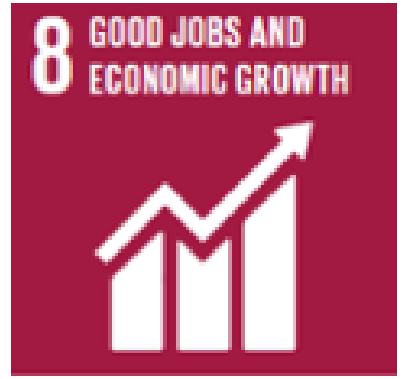
United Nations Sustainable Development Goals (SDGs): affordable, reliable, everywhere, safe, inclusive, fair, equal, resilient, sustainable, all ages

AI and SDGs

Tracking poverty (SDG1)

Diagnosis (SDG3)

Causal influences development programs education (SDG4)



Micro–finance (SDG8)

Greenhouse emissions and smart cities (SDG11&13)

Global partnerships (SDG17)

AI Support Programs

UN ITU partner
IBM Watson
AI XPRIZE

- ❑ $5 million prize
- ❑ Diverse and open sources
- ❑ Solving grand challenges

International standards?

IEEE ethics, Stanford project “100 Year Study”

BSI8611 ethics design and application robots

US Whitehouse 2 AI reports in Oct

Partnership on AI for People and Society

21 UN Agencies & XPRIZE AI FOR GOOD

Cybersecurity and AI Risks

What are the AI applications exposing risk?

- ❑ Email filtering: SPAM?
- ❑ Personalization: Amazon, Netflix?
- ❑ Fraud detection: Credit cards?
- ❑ Speech recognition: Chatbots, Robo Advisors?
- ❑ Image/video recognition: Airports, Policing, Social Media?
- ❑ Autonomous vehicles: Cars, trucks, drones?
- ❑ Robots: Factories and Consumer facing?
- ❑ Human/machine hybrids: Wearable, embedded?
- ❑ CASL – classic, augmented, synthetic Life?
- ❑ Data, security, privacy, trust?

Cybersecurity Questions

Do we need IT professionals?

- ❑ Who will protect us?
- ❑ What are the Cyber risks?
- ❑ Who will mange the risks of:

AI/ML, IoT, Big Data?

International Standards in trustworthy conduct mitigating risk?

Economy grow through safe e-commerce?

Benefit of IoT without the risk?

Where is AI of Everything providing risk exposure?

How do we ensure AI for Good?

How do we partner for ethical and trustworthy computing?

Discussions on AI

ACM Learning Center

IDG-IT World

ICSE 2016

Resources

Discussions with over 1000 experts, most here: http://bit.ly/1mbO2MG

Computing Educators Oral History Project

http://www.southwestern.edu/departments/mathcompsci/OHProject/other-ohprojects.html

WE CALL FOR GLOBAL COOPERATION

#AIforGood

AI can help solve humanity's grandest challenges

THANK YOU

Appendix:
Added information

Resources—discussions with over 1000 experts, most here: **http://bit.ly/1mbO2MG**

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