

# Robonomics: principles, benefits, challenges and solutions

**Stanislav Ivanov**

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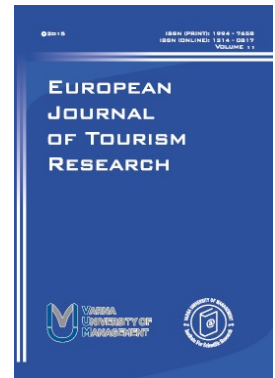
Web: <http://stanislavivanov.com>



# Dr. Stanislav Ivanov



- Professor and Vice Rector (Research), *Varna University of Management*, Bulgaria (<http://www.vum.bg>)
- Editor-in-chief of the *European Journal of Tourism Research* (<http://ejtr.vumk.eu>)
- CEO of *Zangador Ltd.* (<http://www.zangador.eu>)
- Member of *AIEST* (<https://www.aiest.org>)



# 69<sup>th</sup> Aiest Conference

## *Key facts:*

- Dates: 25<sup>th</sup>-29<sup>th</sup> August 2019
- Organiser: Varna University of Management, Varna, Bulgaria
- Venue: Rosslyn Hotel Dimyat 4\* (<http://dimyat.rosslyn-hotels.com/>)
- More information at:  
<https://www.aiest.org/conference/conference-2019-varna/>



Forthcoming on 14<sup>th</sup> October  
2019

Robots, Artificial  
Intelligence and  
Service Automation  
in Travel, Tourism  
and Hospitality



EDITED BY  
STANISLAV IVANOV  
CRAIG WEBSTER



## CALL FOR PAPERS



## TOURISM ECONOMICS

Special Issue on “The Economics of Revenue Management in Hospitality and Tourism”

*Guest Editor*

Stanislav Ivanov, Varna University of Management, Bulgaria,  
[stanislav.ivanov@vumk.eu](mailto:stanislav.ivanov@vumk.eu)



Volume 28 ISSN 2211-9736 October 2018

# Tourism Management Perspectives

EDITOR-IN-CHIEF  
Catheryn Khoo-Lattimore



## Tourism Management Perspectives

### Special Issue: Tourism beyond humans - robots, pets and teddy bears

Editor-in-chief: Catheryn Khoo-Lattimore  
Associate Editor: Babak Taheri

#### Special Issue Editors:

**Stanislav Ivanov**, Professor in Tourism and Vice Rector (Research), Varna University of Management, Bulgaria

**Ulrike Gretzel**, Senior Fellow, USC Center for Public Relations, Annenberg School of Communication & Journalism, University of Southern California, USA

**Ian Yeoman**, Associate Professor, Victoria University of Wellington, New Zealand, and Visiting Professor, European Tourism Futures Institute, The Netherlands

# <https://nexttourismgeneration.eu>

➤ The Next Tourism Generation (NTG) is a Tourism Sector Skills Alliance for implementing a new strategic Blueprint approach to sectoral cooperation on skills



➤ 14 partners represent the whole Tourism sector including specialists in hospitality, food and beverage, travel agencies, attractions and recreation.

➤ The blueprint strategy will respond to skills gaps in tourism and hospitality, especially soft skills and emerging skill needs in digital and sustainability applications



➤ NTG project will concentrate upon to bridge the gap between education and industry and progress the skills needed



Co-funded by the  
Erasmus+ Programme  
of the European Union

Robots, AI and automation technologies have arrived ...

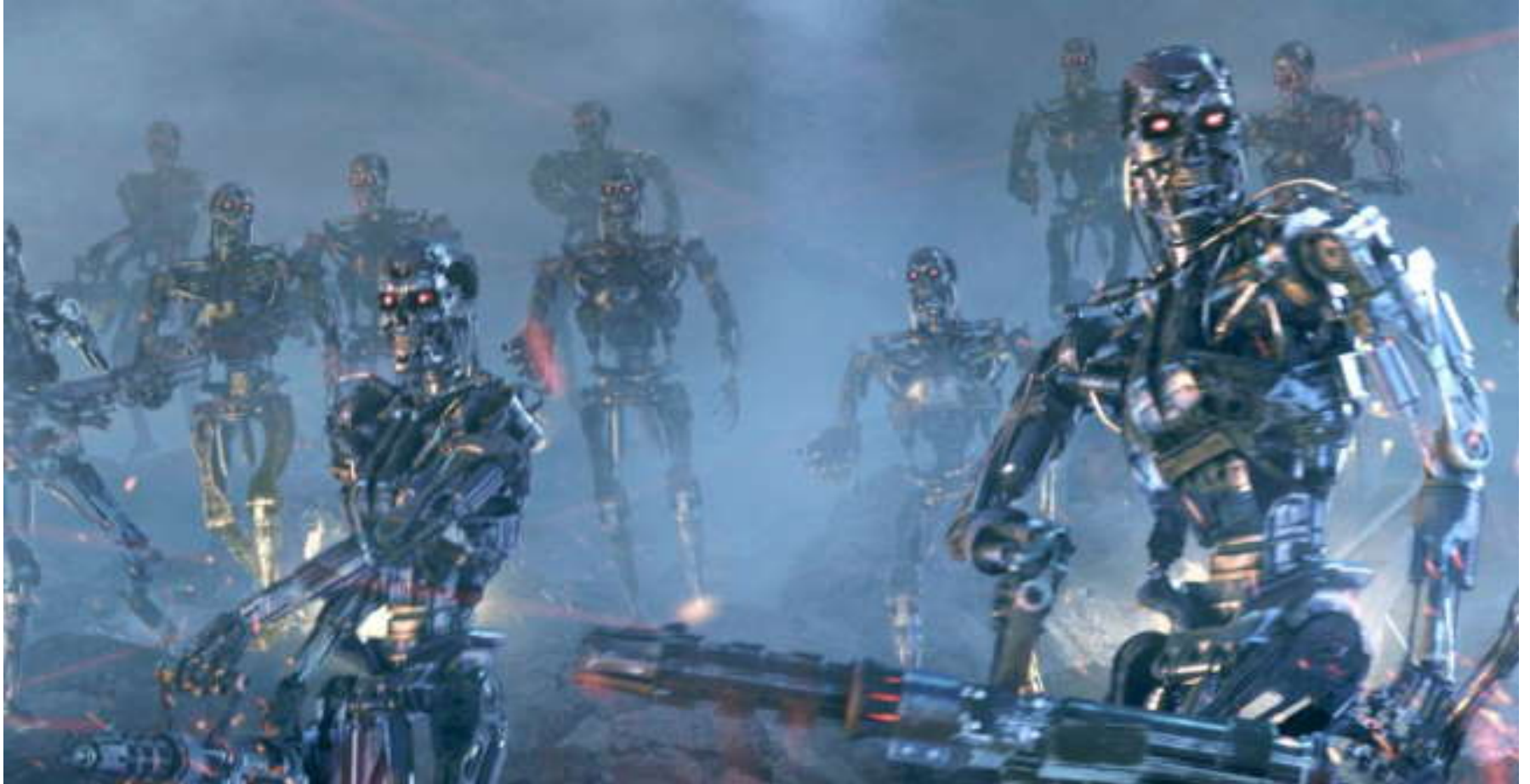


Source: <http://vignette4.wikia.nocookie.net/starwars/images/c/c8/Counterparts.jpg>



<https://en.wikipedia.org/wiki/BB-8>





Source: <http://vignette2.wikia.nocookie.net/avp/images/4/49/Terminator.jpg>



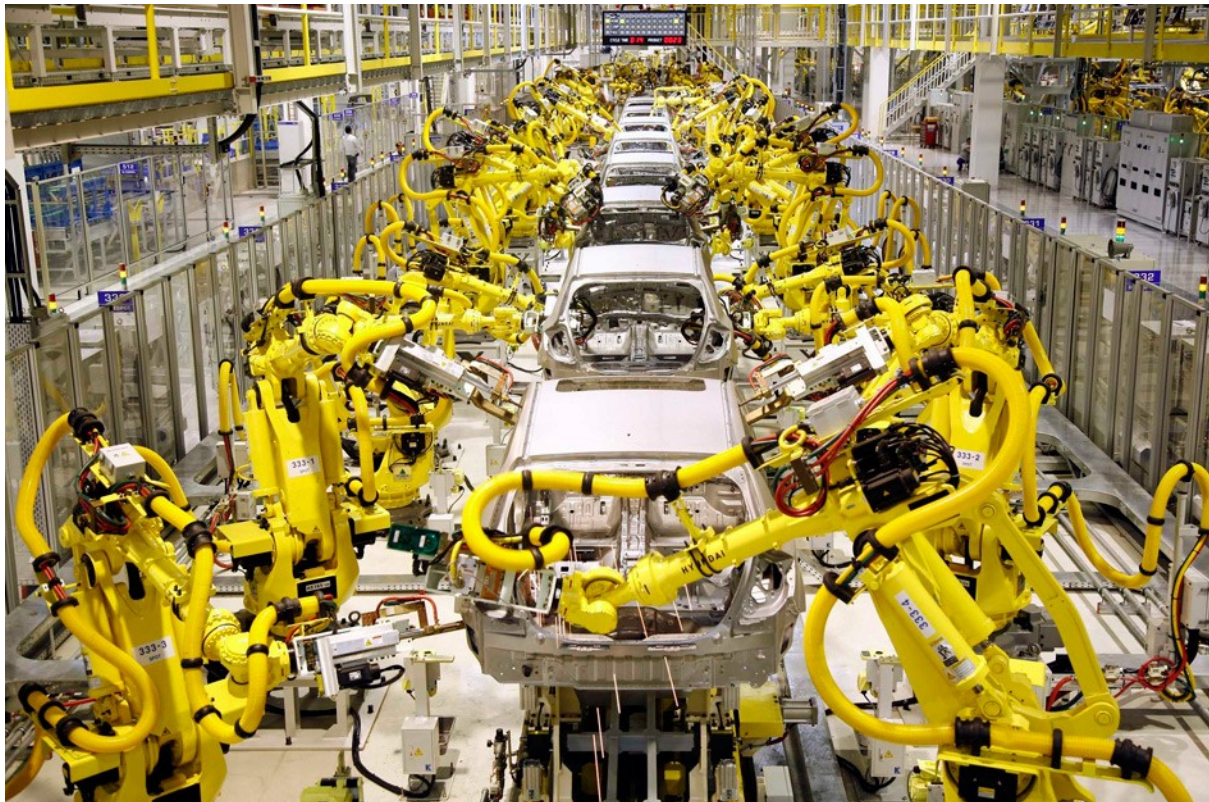
Source: <http://www.kurzweilai.net/images/robot-thinking-one.png>

# Application of robots, AI and automation technologies



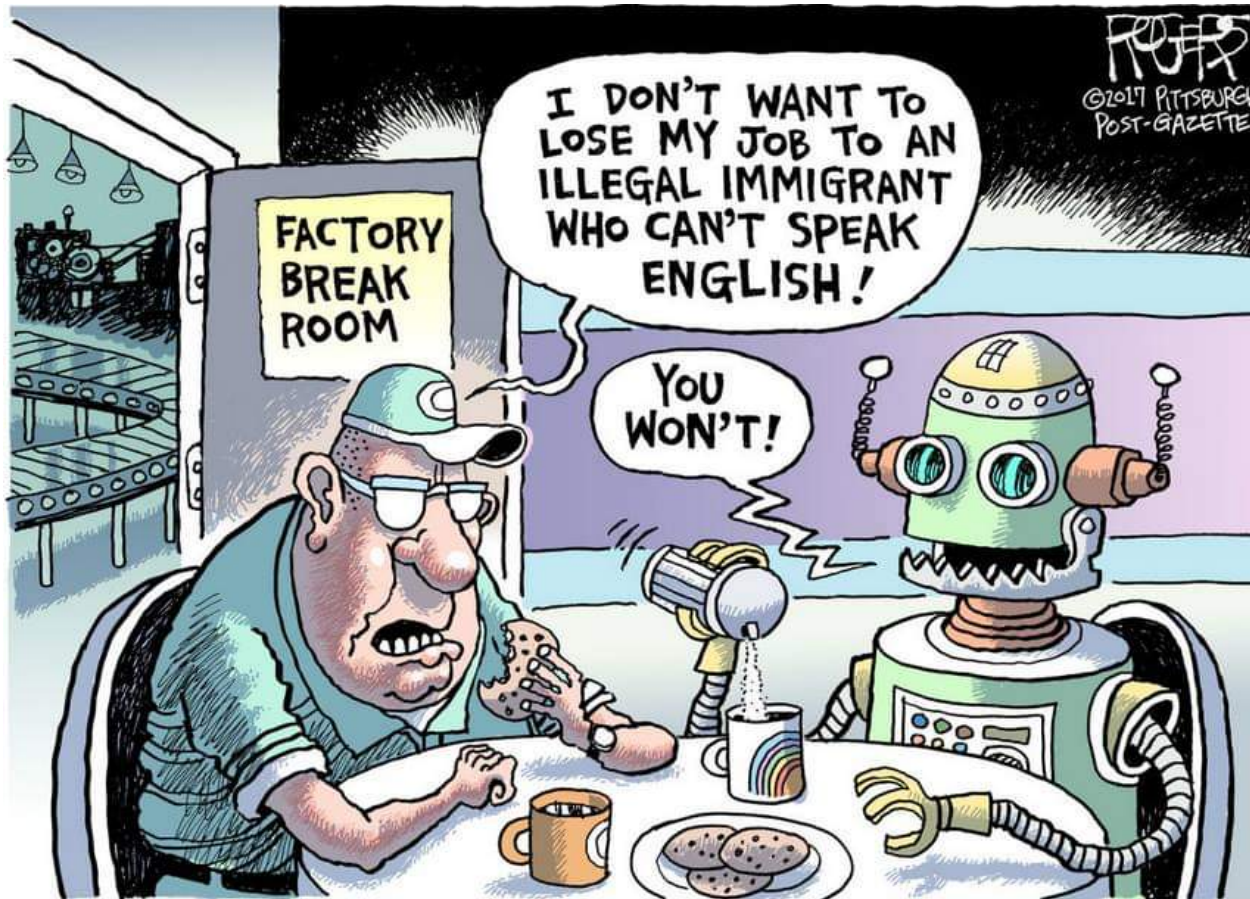
# Application of robots, AI and automation technologies:

- *Manufacturing*



# Application of robots, AI and automation technologies:

- *Manufacturing*





# Application of robots, AI and automation technologies:

- *Warehousing, supply and logistics*



# Application of robots, AI and automation technologies:

- *Warehousing, supply and logistics*



# Application of robots, AI and automation technologies:

- *Agriculture*





# Application of robots, AI and automation technologies:

- *Transportation / Autonomous cars*



[https://media.wired.com/photos/5a6fbe7d68851b1549e7d280/master/w\\_799,c\\_limit/Waymo-Minivan.jpg](https://media.wired.com/photos/5a6fbe7d68851b1549e7d280/master/w_799,c_limit/Waymo-Minivan.jpg)

# Application of robots, AI and automation technologies:

- *Medicine*



[http://mediad.publicbroadcasting.net/p/wual/files/styles/x\\_large/public/201712/xi.jpg](http://mediad.publicbroadcasting.net/p/wual/files/styles/x_large/public/201712/xi.jpg)

# Application of robots, AI and automation technologies:

- *Warfare*



<https://media.defense.gov/2010/Feb/01/2000398487/1088/820/0/090609-F-0000M-777.JPG>



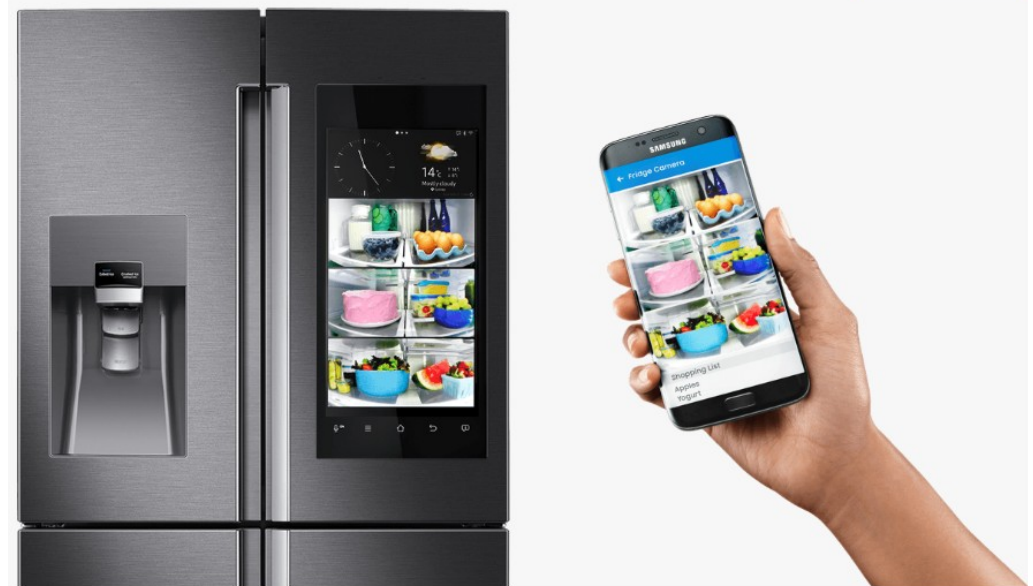
# Application of robots, AI and automation technologies:

- *Legal services*



# Application of robots, AI and automation technologies:

- *Households*



<https://www.samsung.com/au/family-hub-refrigerator/>

<http://www.roboticstrends.com/images/photos/xiaomi-mi-robot-vacuum.jpg>

# Application of robots, AI and automation technologies:

- *Households*



# Application of robots, AI and automation technologies:

- *Swimming pools*
- *Gardens*



Photo credit: Stanislav Ivanov



# Application of robots, AI and automation technologies:

- *Guards*



<http://cdn.hiconsumption.com/wp-content/uploads/2014/11/K5-Security-Guard-Robot-3.jpg>

- *Parcel delivery*



[https://media.wired.com/photos/5c48c3ab9fa6e032a790af23/master/w\\_799,c\\_limit/amazon-scout.jpg](https://media.wired.com/photos/5c48c3ab9fa6e032a790af23/master/w_799,c_limit/amazon-scout.jpg)

# Application of robots, AI and automation technologies:

- *Education*
- *Entertainment*



Source: <https://3e7e6c34hre53ebye38hmr6-wpengine.netdna-ssl.com/wp-content/uploads/2017/09/nao.png>

<https://robots.nu/img/uploads/2018/08/10/Vector%2C%20adorable%20robot%20from%20Anki.jpg>

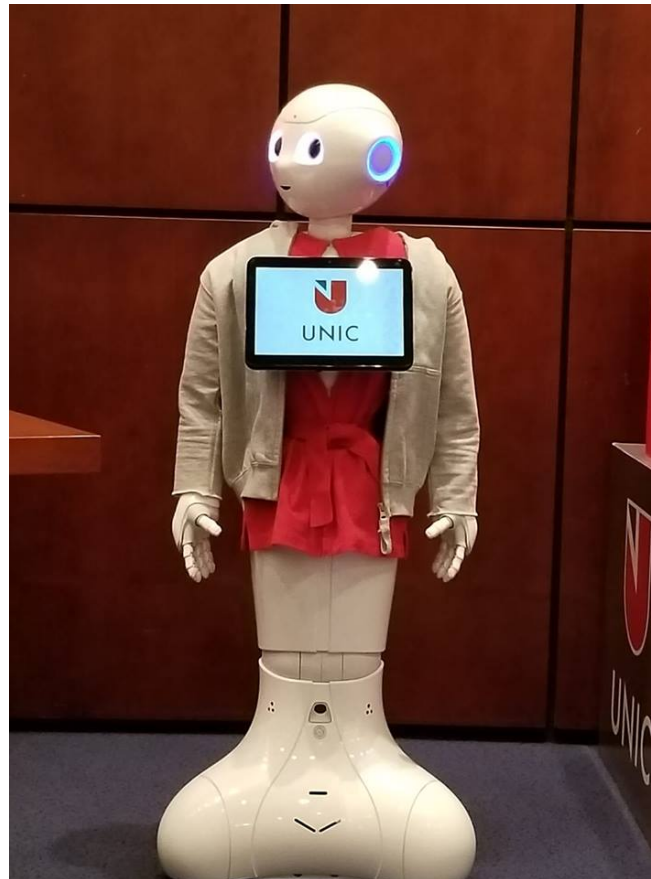
# Application of robots, AI and automation technologies:

- *Information provision in service industries*



# Application of robots, AI and automation technologies:

- *Smart-looking and attentive robotic students!*





# Application of robots, AI and automation technologies:

- *Cucumbers cutting robots*



vk.com/sciencebreaks

# Application of robots, AI and automation technologies:

- *Sex services*

18

+



<https://surgefs.imgix.net/quality=v:80/K25JiHV0QUKIXCo9usln?auto=format&ixlib=imgixjs-3.3.2&w=1000>



<https://www.vanguardngr.com/wp-content/uploads/2018/02/Sex-robot-2.png>

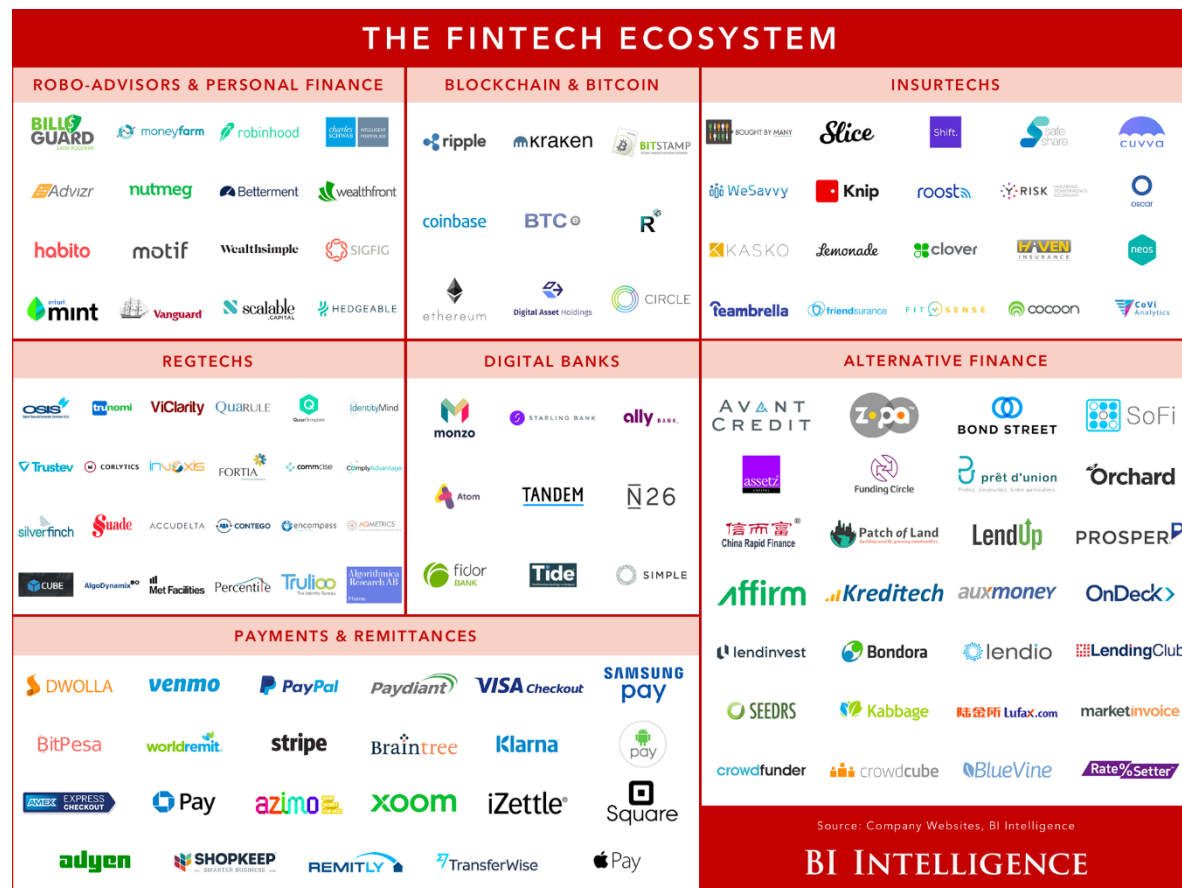
# Application of robots, AI and automation technologies:

- *Search engines*
- *E-commerce*

The Google logo, featuring the word "Google" in its characteristic multi-colored font: blue 'G', red 'o', yellow 'o', green 'g', and red 'le'.The Amazon logo, featuring the word "amazon" in a bold, black, lowercase sans-serif font, with a curved orange arrow underneath that points from the 'a' to the 'z'.

# Application of robots, AI and automation technologies:

- *Finance*



# Application of robots, AI and automation technologies:

- *Digital assistants*

Introducing  
**echo show**

Now Alexa can show you things



Skills add even more capabilities like ordering a pizza from Domino's, requesting a ride from Uber, opening your garage with Garagio, and more. Enabling skills lets your Echo do even more—simply discover and enable the skills you want to use in the Alexa App.

New skills are being added all the time. You can also see ratings and reviews to learn what other customers are saying about the thousands of skills available in the Alexa App. [Discover and enable skills.](#)

"Alexa, tell Garagio to close my door."

"Alexa, ask Automatic if I need gas."

"Alexa, ask HuffPost for headlines."

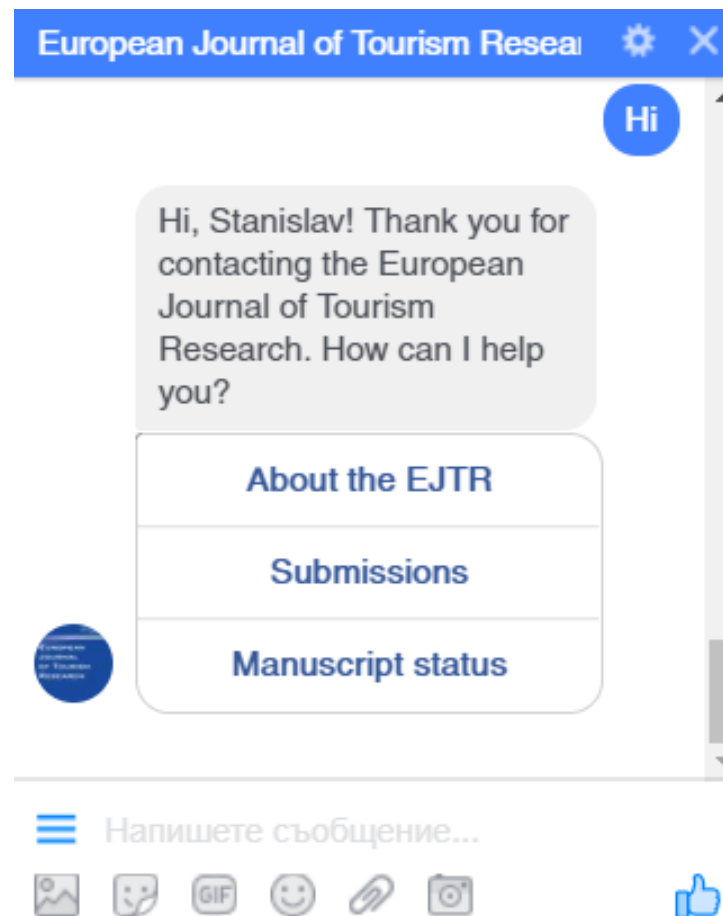
"Alexa, ask TV Shows what time does  
The Walking Dead start?"

"Alexa, ask Campbell's Kitchen for a recipe."

"Alexa, ask Fidelity, how is the  
NASDAQ doing today?"

# Application of robots, AI and automation technologies:

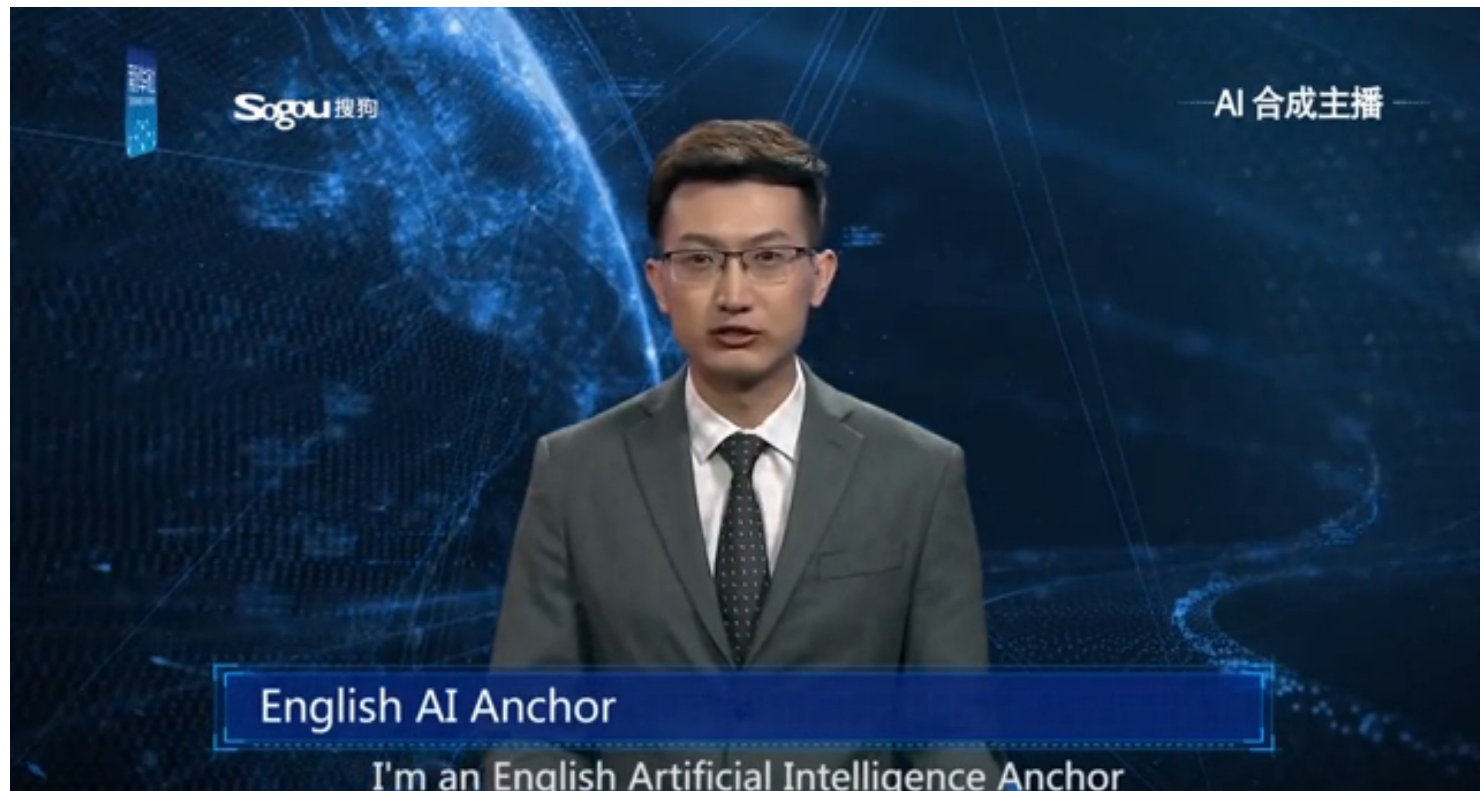
- *Social media chatbots*





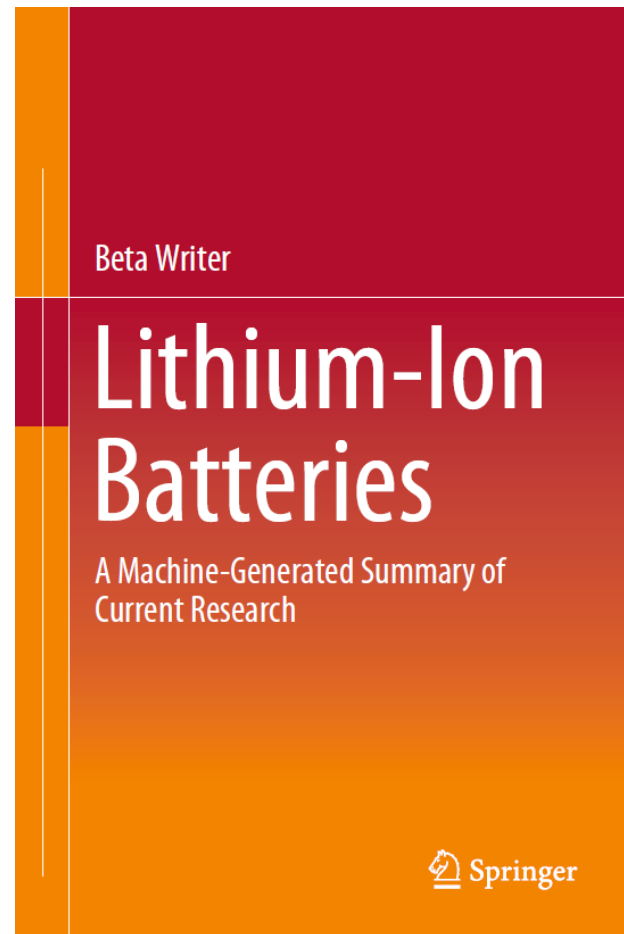
# Application of robots, AI and automation technologies:

- *Journalism*



# Application of robots, AI and automation technologies:

- *Academic research*





# Application of robots, AI and automation technologies:

- *Retail*



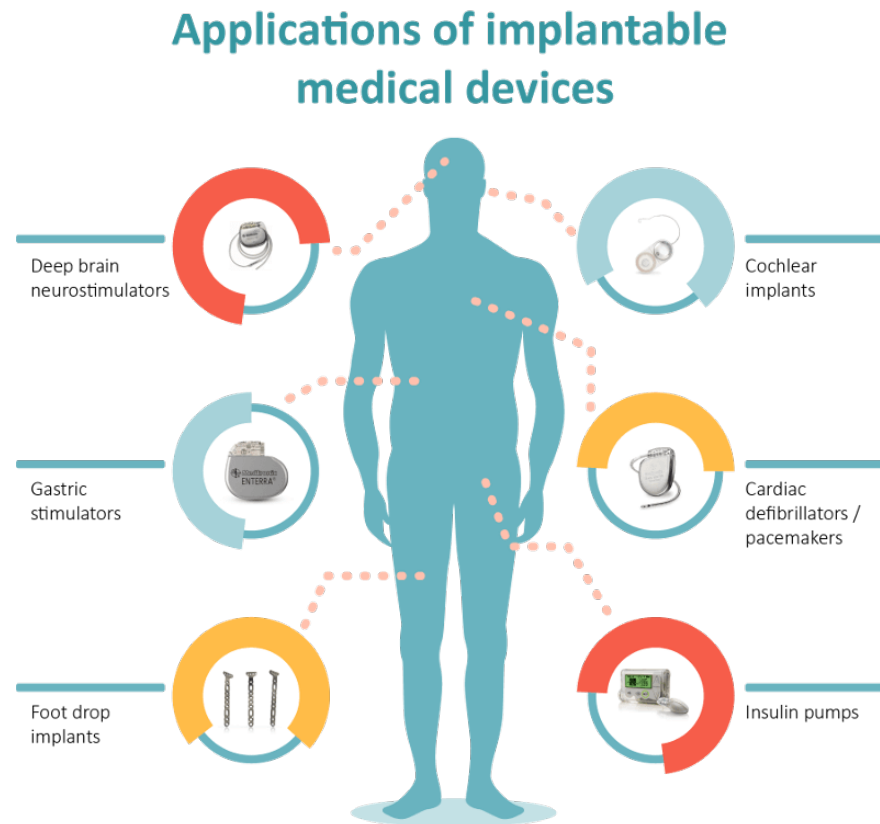
# Application of robots, AI and automation technologies:

- *Wearable technology*



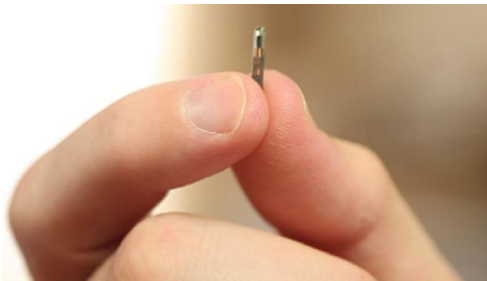
# Application of robots, AI and automation technologies:

- *Implantable technology*



# Application of robots, AI and automation technologies:

- *Human microchip implants*



[https://images0.persgroep.net/rcs/RMKm0FTwBIXgGqtXjB0rmA2V59I/diocontent/109189031/\\_crop/1/225/899/509/\\_fitwidth/763?appId=2dc96dd3f167e919913d808324cbfeb2&quality=0.8](https://images0.persgroep.net/rcs/RMKm0FTwBIXgGqtXjB0rmA2V59I/diocontent/109189031/_crop/1/225/899/509/_fitwidth/763?appId=2dc96dd3f167e919913d808324cbfeb2&quality=0.8)

<https://static.independent.co.uk/s3fs-public/thumbnails/image/2017/04/06/15/an119077210epa05887654-a-pi.jpg>

<https://am14.akamaized.net/med/cnt/uploads/2017/04/2015-02-26-YouTube-Microchip-768x432.jpg>

The tendency to use RAIA in the production of goods and services will accelerate in the future until society reaches a point when all (or an overwhelming share of) goods and services are produced by RAIA with limited human involvement. Such an economic system, based on robots, artificial intelligence and (service) automation, is called '*robonomics*'



*Robonomics* is an economic system that uses robots, artificial intelligence and (service) automation technologies as production factors, instead of human labour.

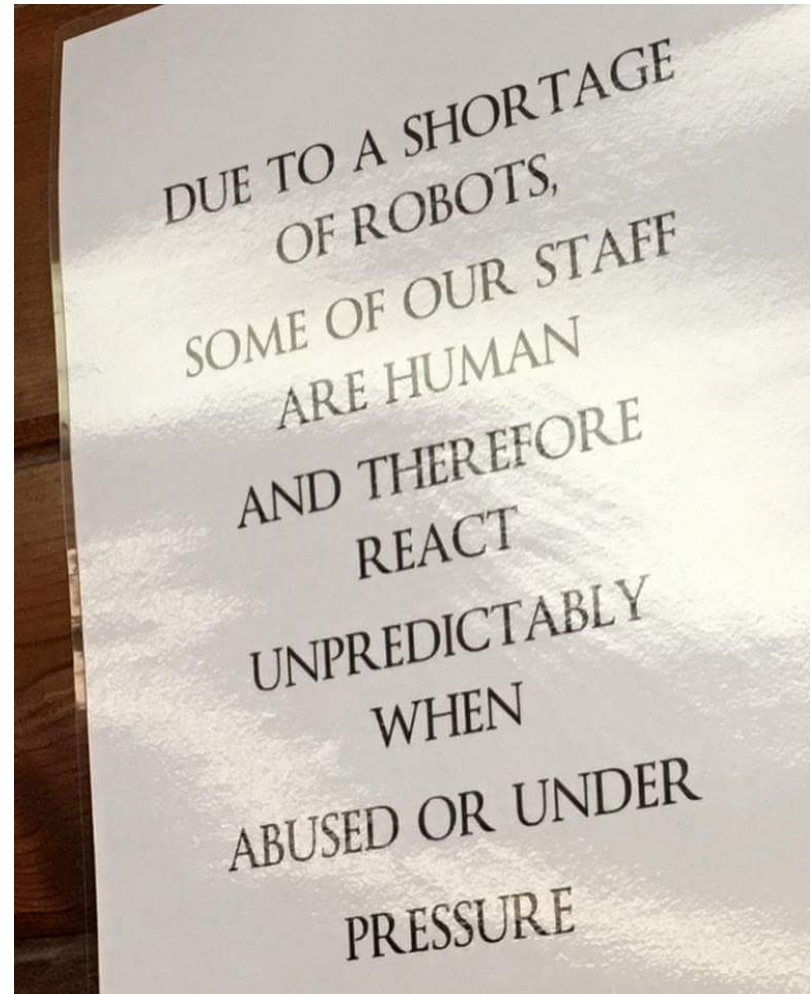
# Why RAIA technologies?

## (1)

- RAIA could work 24/7
- RAIA could implement various tasks and expand their scope with software and hardware upgrades
- RAIA could provide constant or improving quality of their work
- RAIA could fulfil their work correctly and in a timely manner
- RAIA could do routine work repeatedly

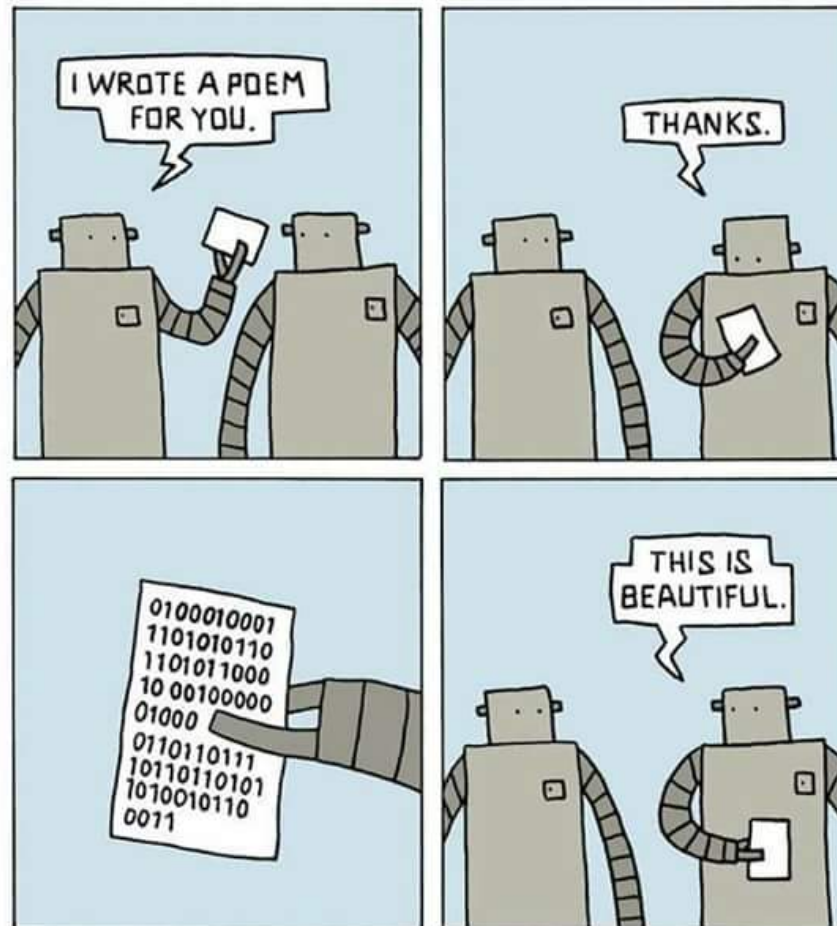
# Why RAIA technologies? (2)

- RAIA do not complain, get ill, go on strikes, spread rumors, discriminate, quit their job without notice, show negative emotions, shirk from work



# Why not RAIA technologies? (1)

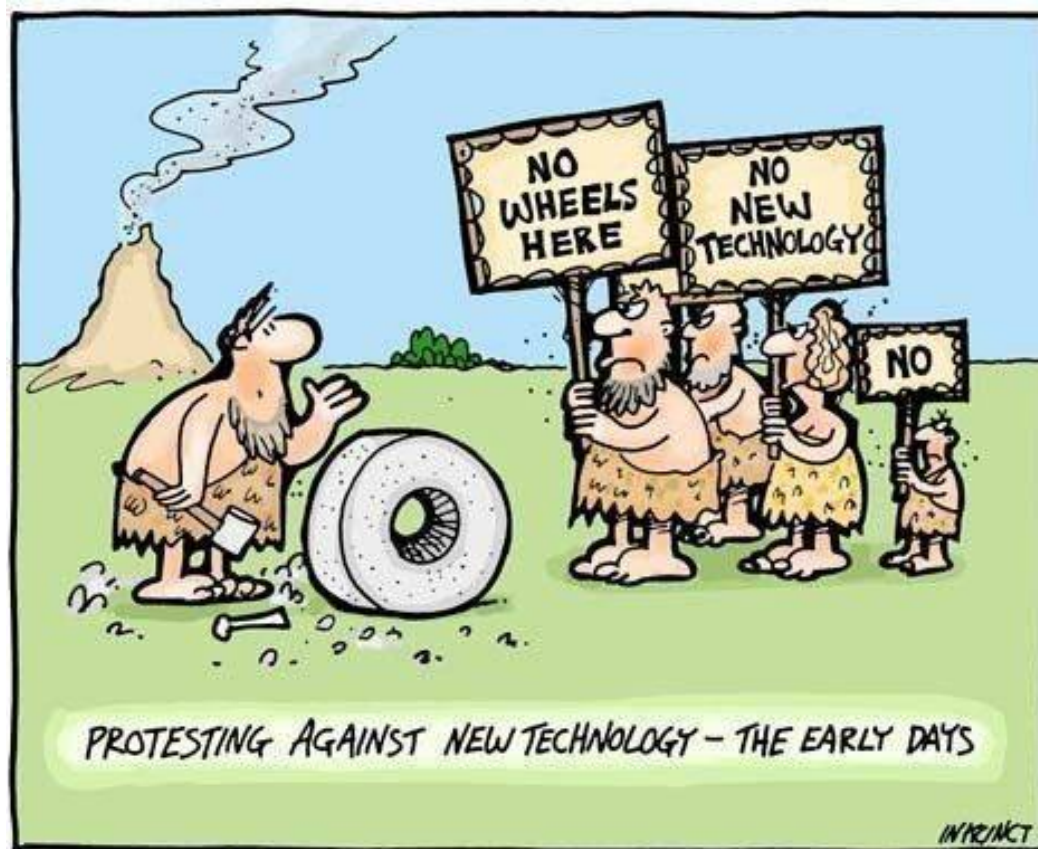
- RAIA lack creativity



# Why not RAIAs technologies?

## (2)

- RAIAs may (will) be perceived as threat by human employees (e.g. Neo-Luddism movement)





# Why not RAIA technologies?

(3)

- RAIA will not be any time soon completely independent of human supervision
- RAIA lack personal approach
- RAIA can orientate in structured situations (at least for the moment)

# Prior studies

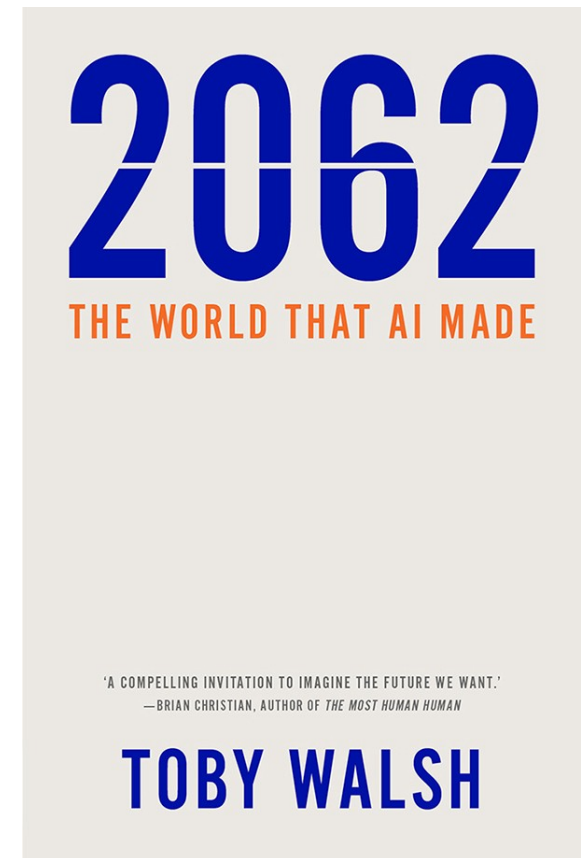
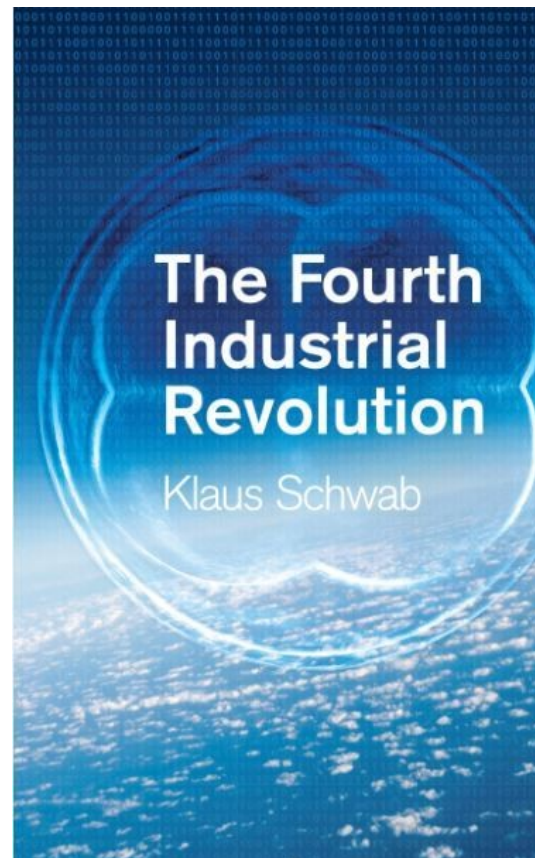
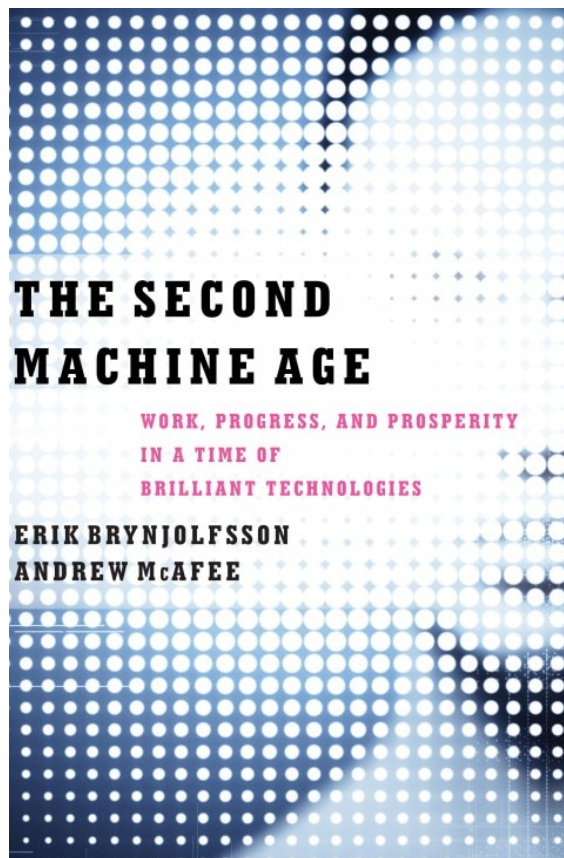
# Prior studies

## *Opposing views of technological progress*

- Researchers' attitudes towards RAIA range from the positive appraisal of liberating humans of manual labour and creating new business opportunities (Brynjolfsson & McAfee, 2014; Frank, Roehring & Pring, 2017; LaGrandeur & Hughes, 2017; Talwar, 2015) to fear of pauperising and making humans obsolete in a fully robotised society (Barrat, 2013; Crews, 2016; Leonhard, 2016).

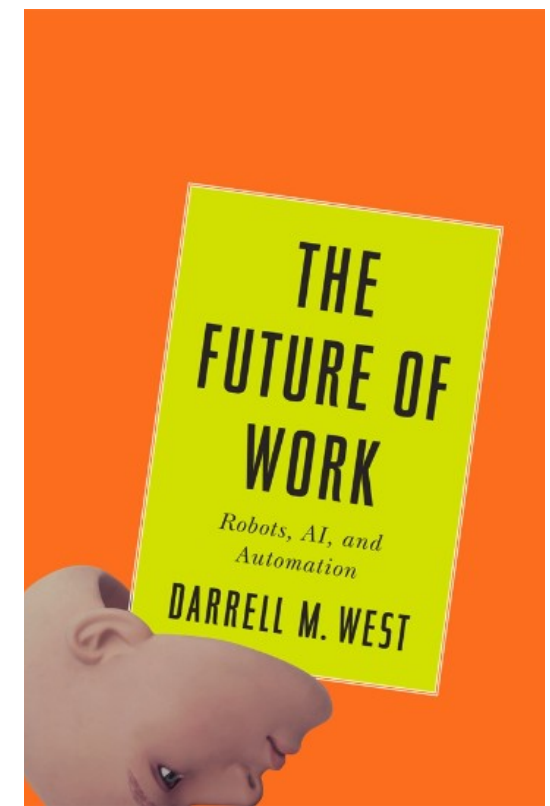
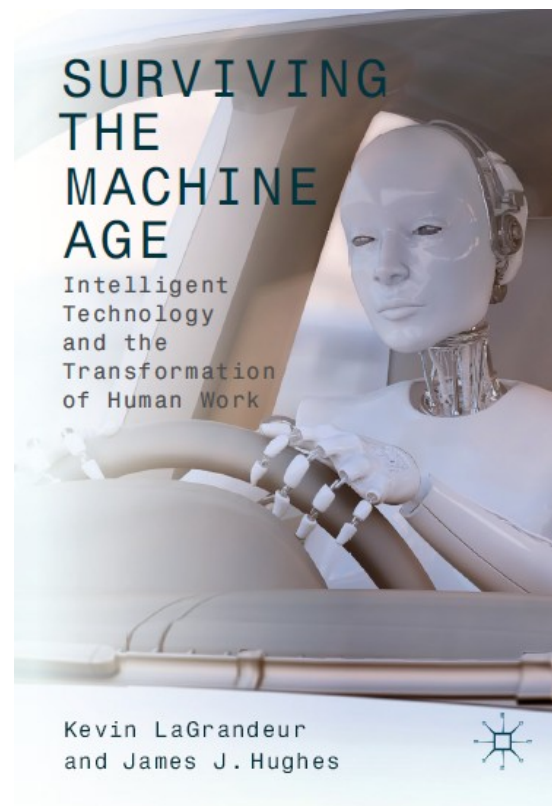
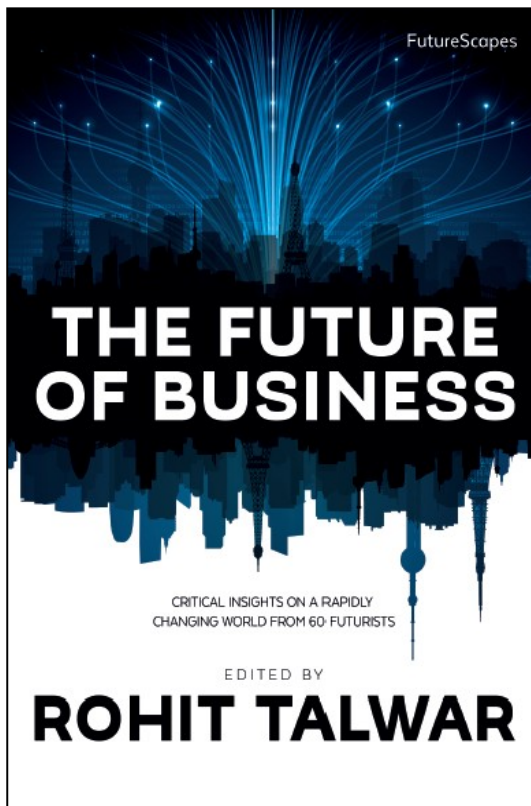
# Prior studies

## *The optimists*



# Prior studies

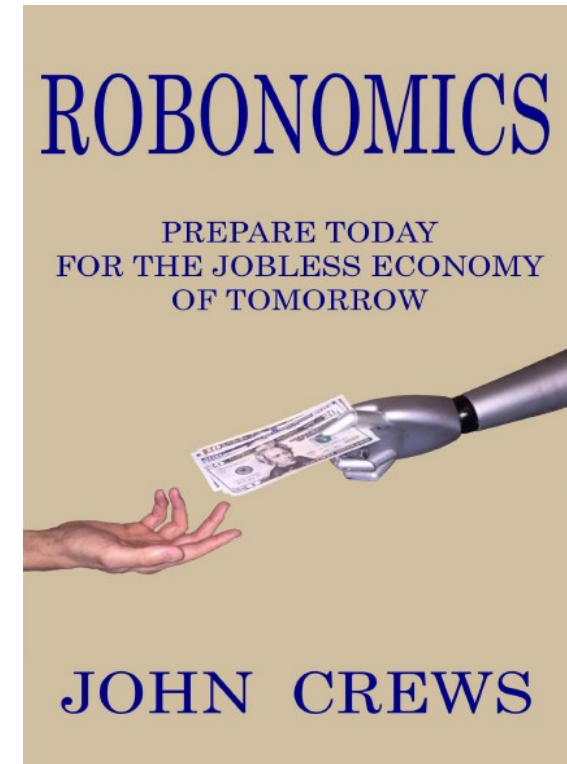
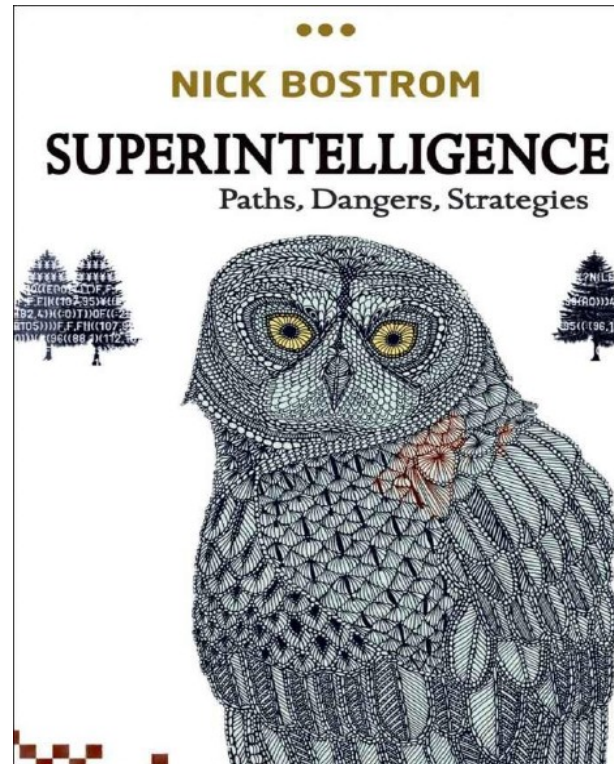
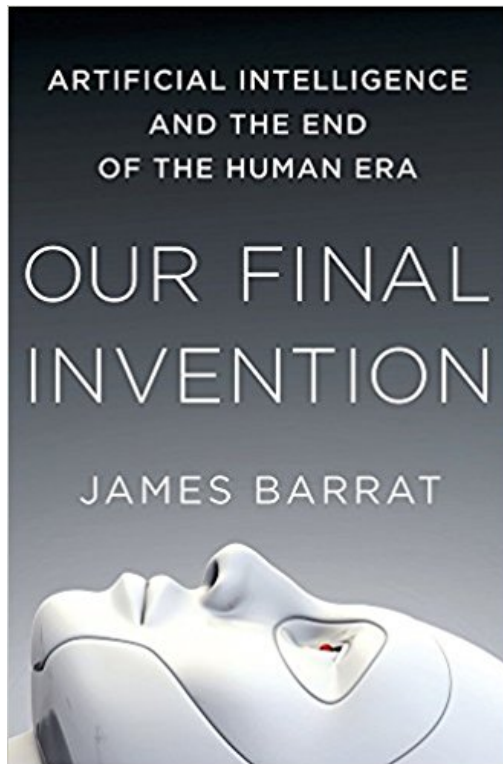
## *The optimists*





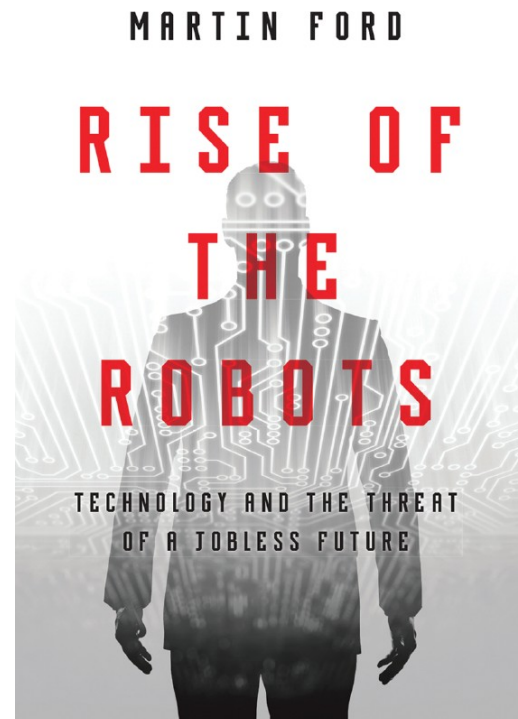
# Prior studies

## *The pessimists*



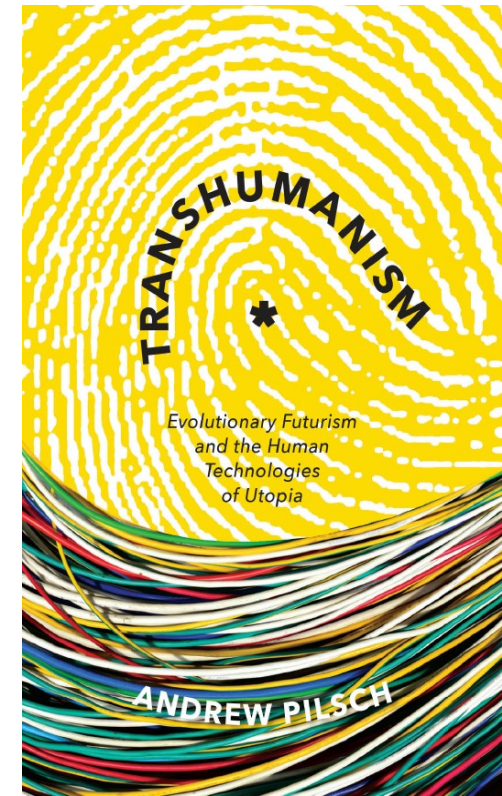
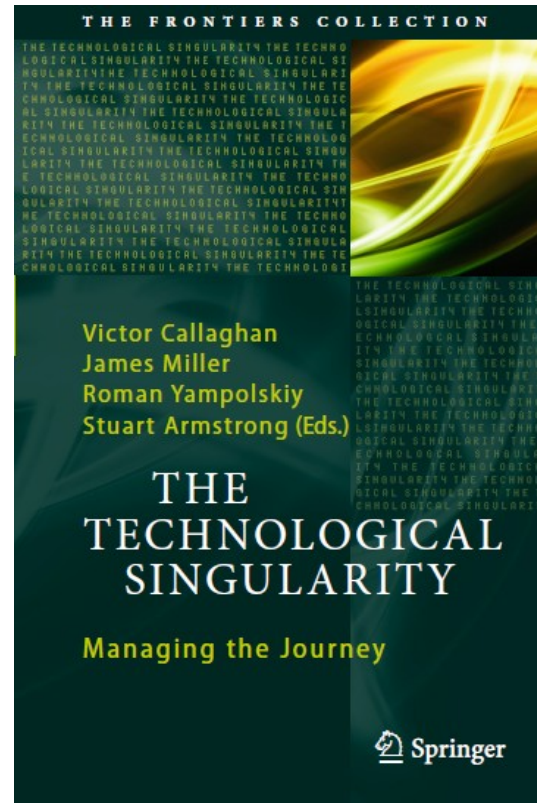
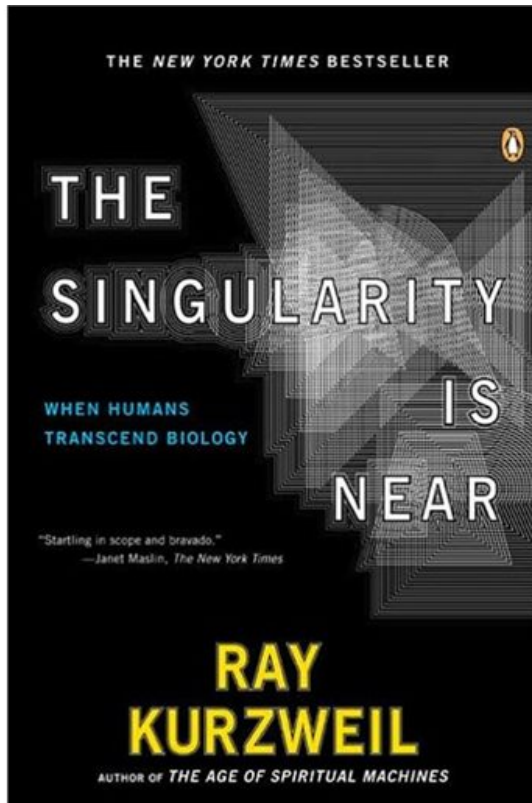
# Prior studies

## *The pessimists*



# Prior studies

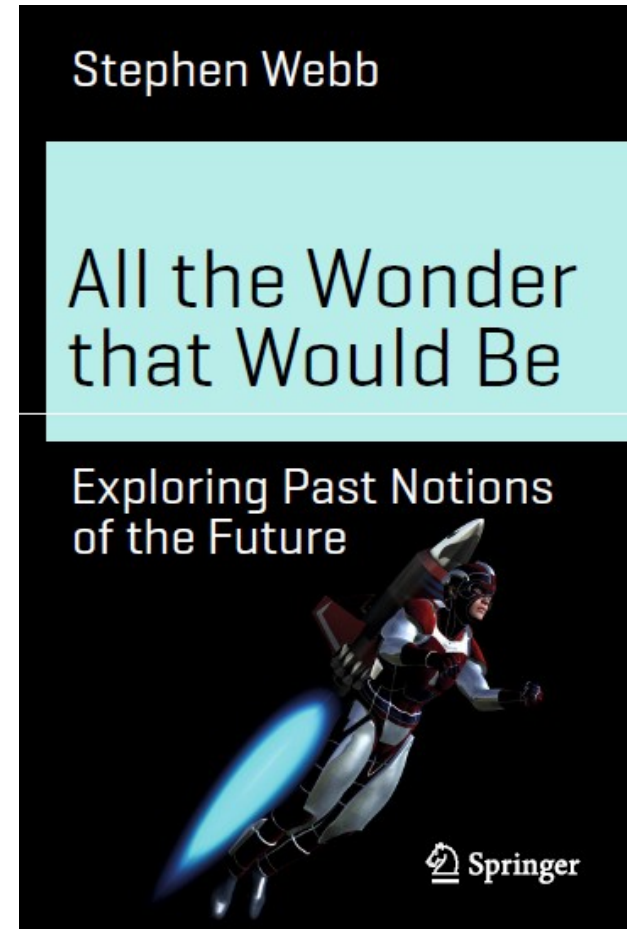
## *The transhumanists ...*





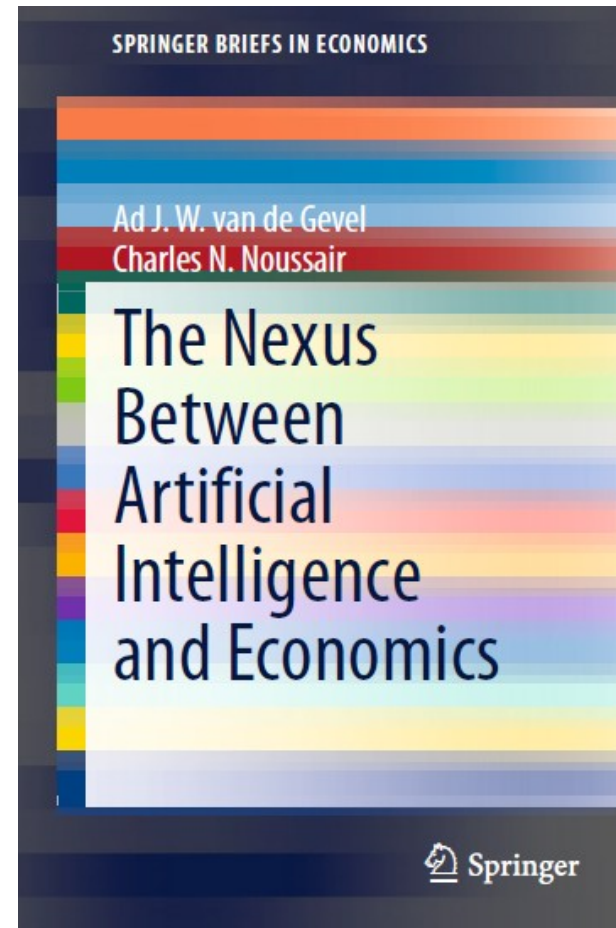
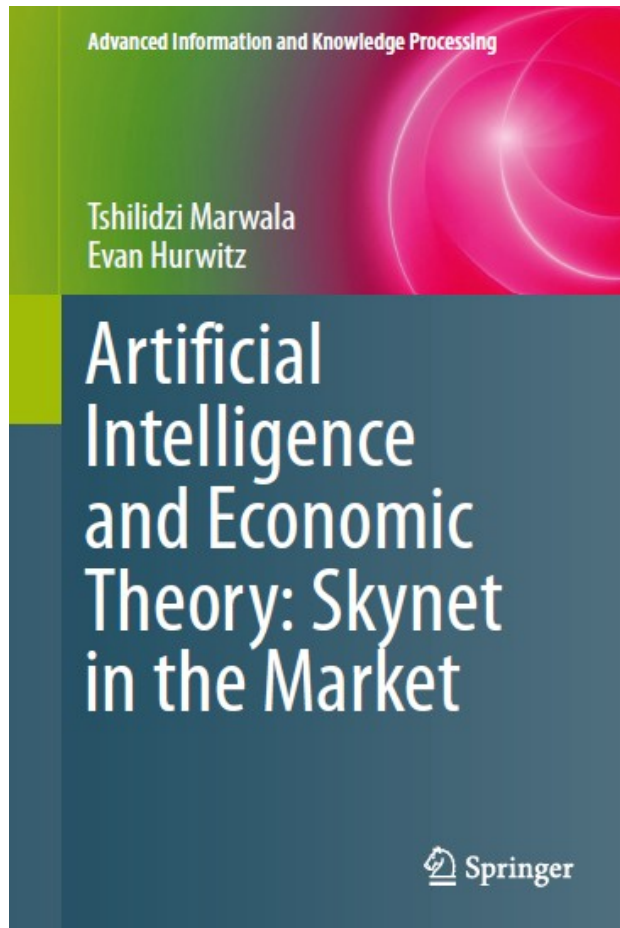
# Prior studies

## *... and the disillusionment*



# Prior studies

## *Economics*





# Prior studies

## *Industry focus*

### ARTIFICIAL INTELLIGENCE COMES OF AGE

The Promise and Challenge of Integrating  
AI Into Cars, Healthcare and Journalism

By David Bollier

THE ASPEN INSTITUTE

A Report on the Inaugural Aspen Institute  
Roundtable on Artificial Intelligence

CHRISTIAN L. DUNIS  
PETER W. MIDDLETON  
ANDREAS KARATHAMASOPOULOS  
KONSTANTINOS THEOFILATOS

### ARTIFICIAL INTELLIGENCE IN FINANCIAL MARKETS

Cutting-Edge Applications  
for Risk Management, Portfolio  
Optimization and Economics

NEW DEVELOPMENTS IN  
QUANTITATIVE TRADING  
AND INVESTMENT

Markus Maurer · J. Christian Gerdes  
Barbara Lenz · Hermann Winner *Editors*

## Autonomous Driving

Technical, Legal  
and Social Aspects

Sponsored by:  
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 Springer Open

# Prior studies

## *The political economy of robots and the future of work*

### HUMANS AND MACHINES AT WORK

Monitoring, Surveillance and Automation in  
Contemporary Capitalism

Edited by  
Phoebe V. Moore, Martin Upchurch  
& Xanthe Whittaker



 Dynamics of  
Virtual Work

### WHAT TO DO WHEN MACHINES DO EVERYTHING



HOW TO GET AHEAD IN A WORLD OF  
AI, ALGORITHMS, BOTS, AND BIG DATA

MALCOLM FRANK,  
PAUL ROHRIG, AND BEN PRING

WILEY

International Political Economy Series

### The Political Economy of Robots

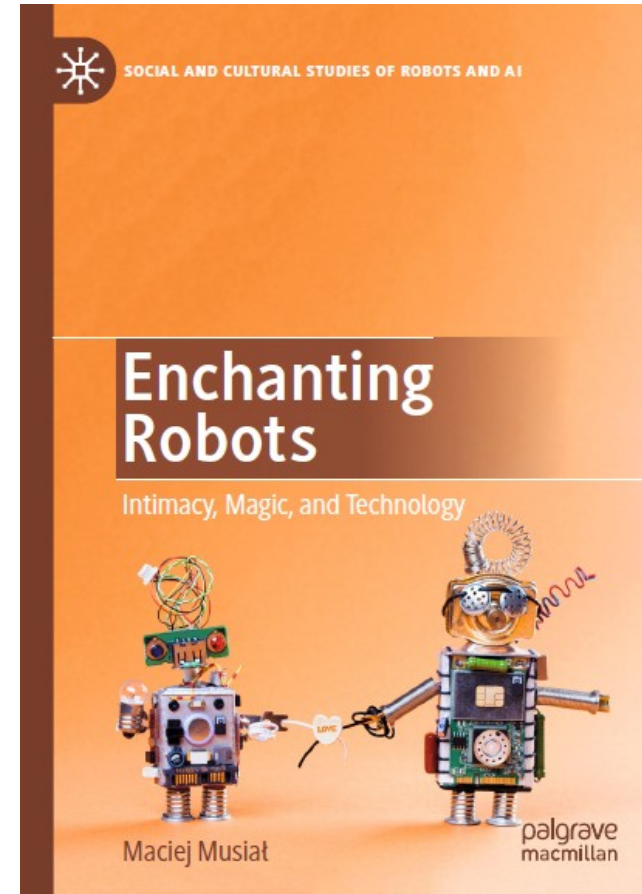
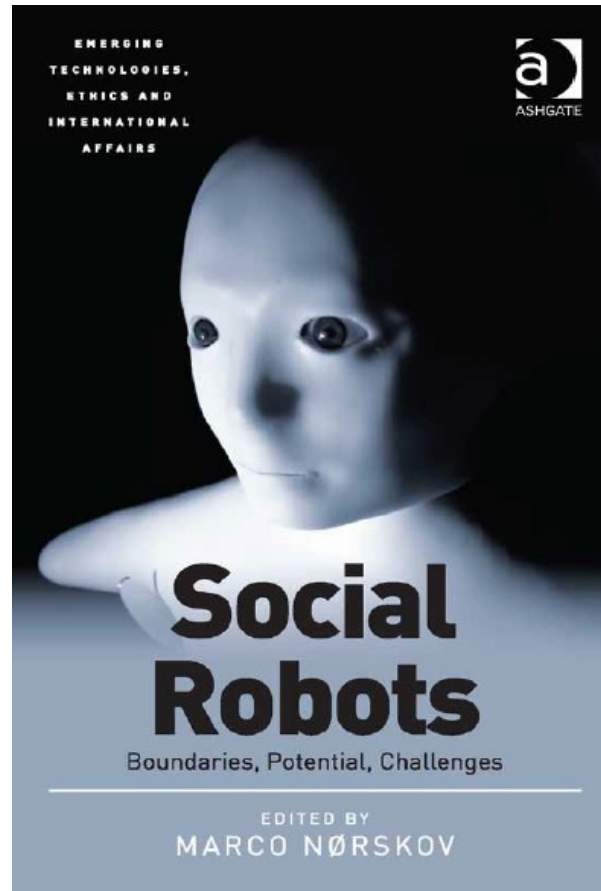
Prospects for Prosperity and Peace  
in the Automated 21st Century

Ryan Kiggins



# Prior studies

## *Robots everywhere*





# Prior studies

## *Conference proceedings*

Lecture Notes in Electrical Engineering 999

Kristiina Jokinen  
Graham Wilcock  
*Editors*

# Dialogues with Social Robots

Enablements, Analyses, and Evaluation

 Springer

Intelligent Systems, Control and Automation:  
Science and Engineering

Maria Isabel Aldinhas Ferreira  
Joao Silva Sequeira  
Mohammad Osman Tokhi · Endre E. Kadar  
Gurvinder Singh Virk *Editors*

# A World with Robots

International Conference on  
Robot Ethics: ICRE 2015

 Springer

Arvin Agah · John-John Cabibihan  
Ayanna M. Howard · Miguel A. Salichs  
Hongsheng He (Eds.)

LNAI 9979

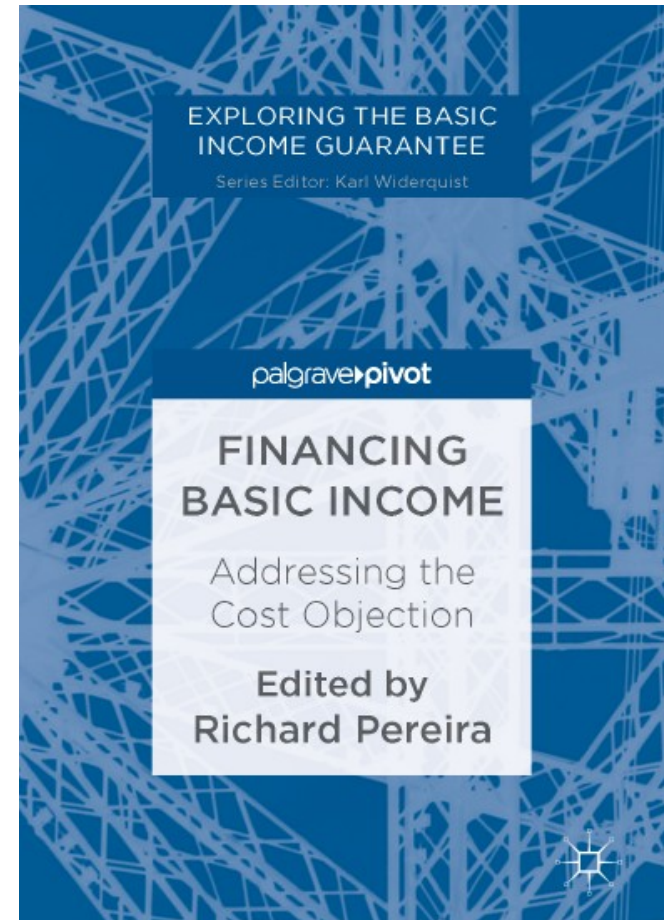
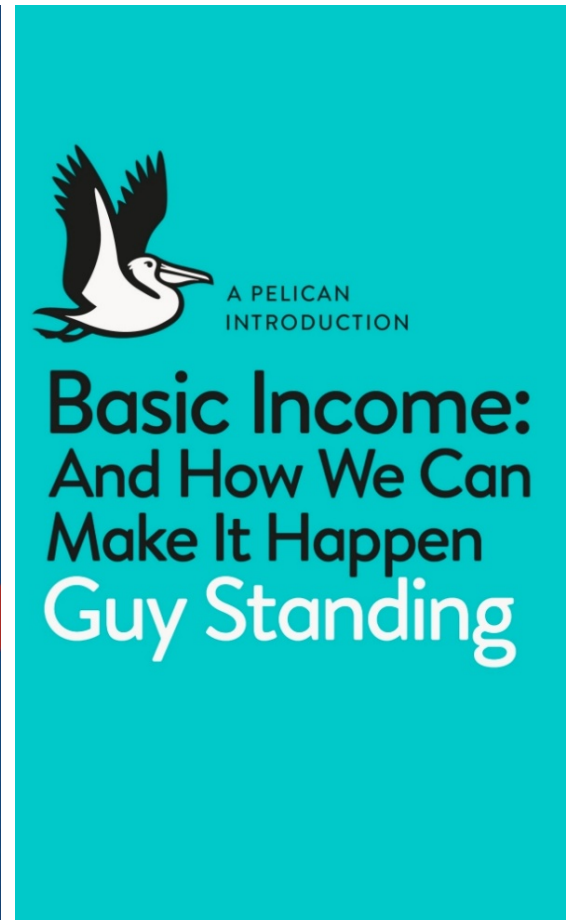
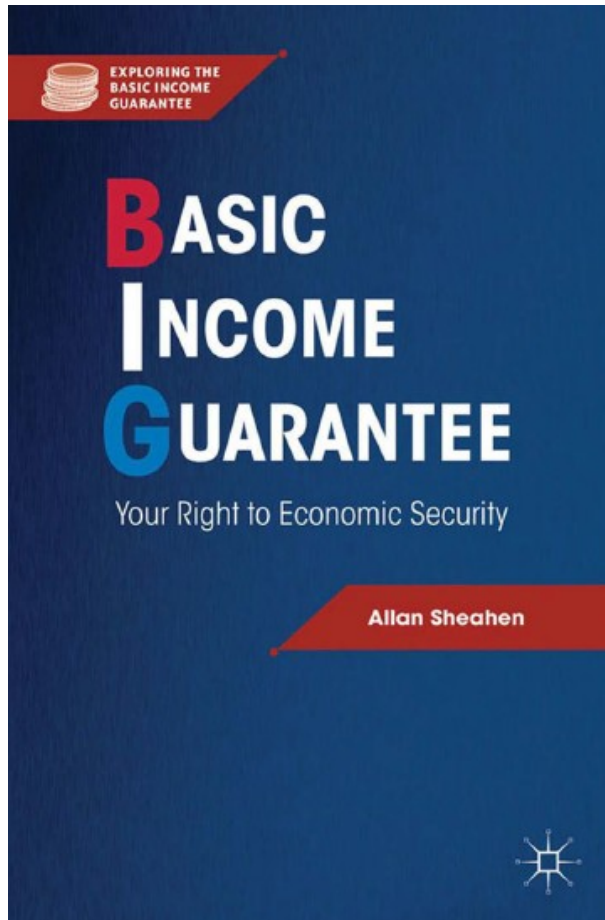
# Social Robotics

8th International Conference, ICSR 2016  
Kansas City, MO, USA, November 1–3, 2016  
Proceedings

 Springer

# Prior studies

## *Basic income*





# Prior studies

## *National security and warfare*

### DIGITAL INFANTRY BATTLEFIELD SOLUTION INTRODUCTION TO GROUND ROBOTICS

DIBS project

Part I

Milrem in collaboration with  
Estonian National Defence College  
Latvian National Defence Academy  
Latvian Institute of International Affairs  
Riga Technical University  
University of Tartu

December 2016

### DIGITAL INFANTRY BATTLEFIELD SOLUTION CONCEPT OF OPERATIONS

DIBS project

Part II

Editors

Uģis Romanovs

Māris Andžāns

Milrem in cooperation with

Latvian Institute of International Affairs  
Latvian National Defence Academy

August 2017

BELFER CENTER STUDY

## Artificial Intelligence and National Security

Greg Allen

Taniel Chan

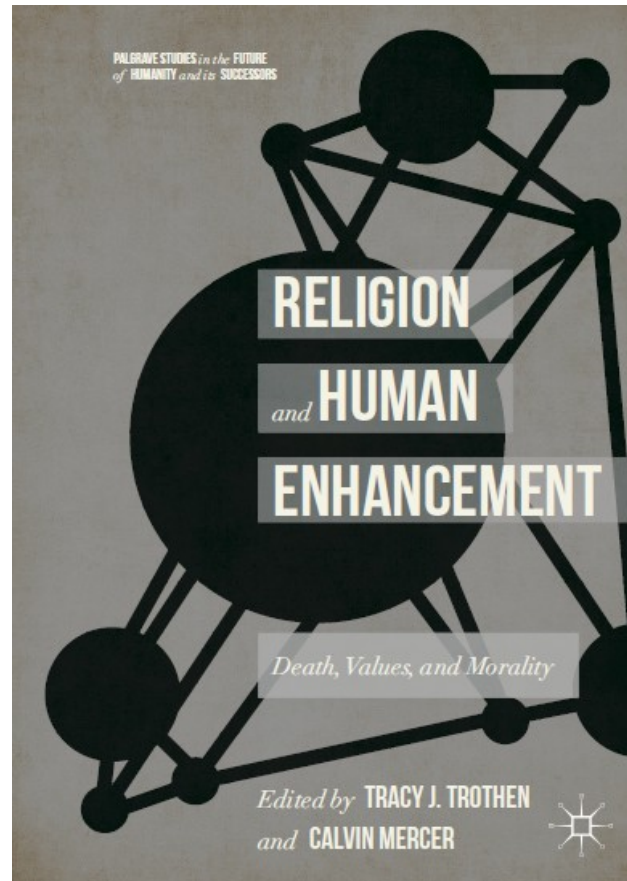
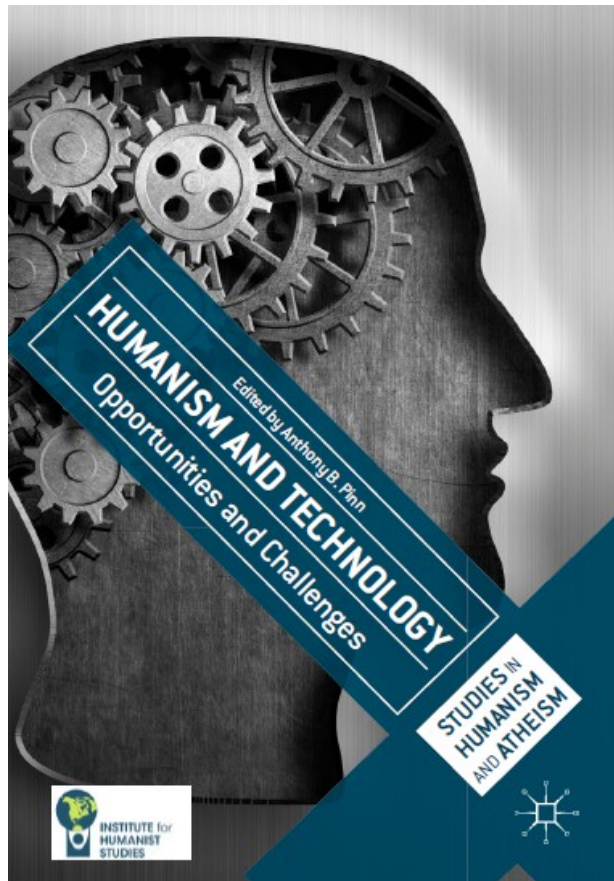
A study on behalf of Dr. Jason Matheny, Director of the U.S.  
Intelligence Advanced Research Projects Activity (IARPA)

HARVARD Kennedy School  
BELFER CENTER  
for Science and International Affairs

STUDY  
JULY 2017

# Prior studies

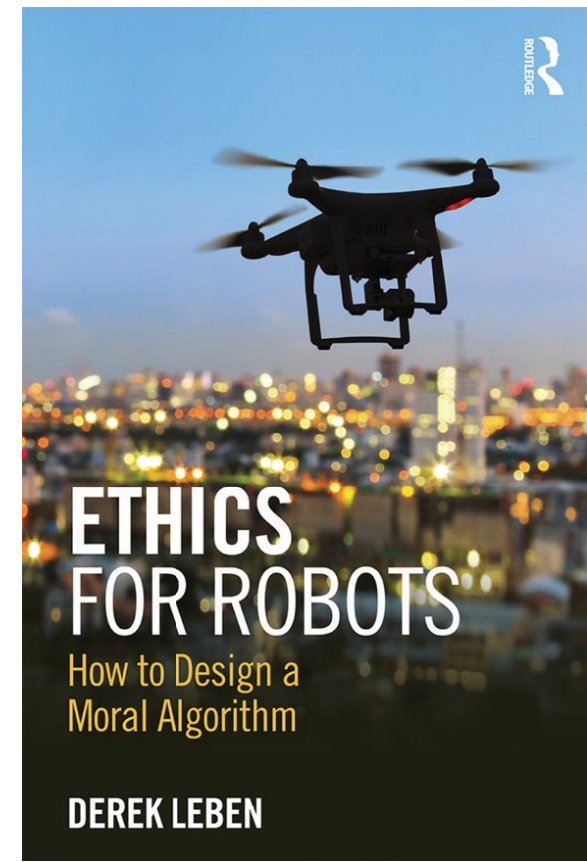
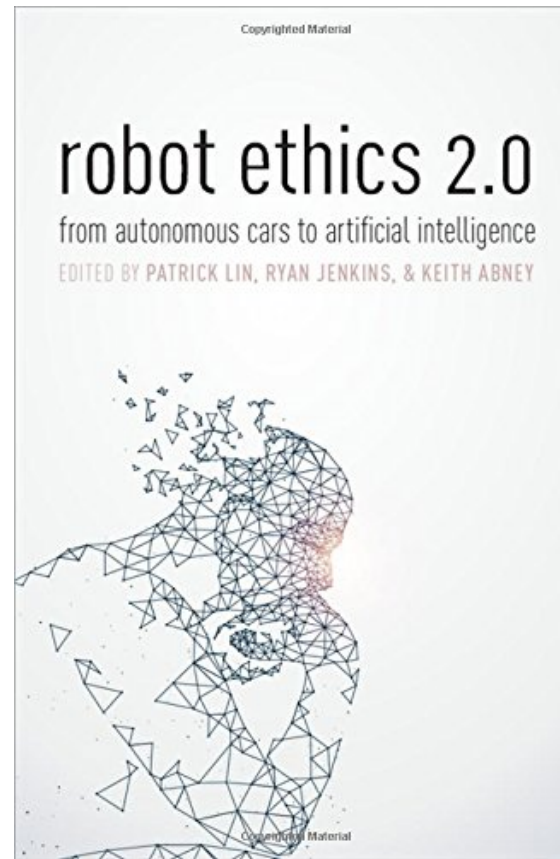
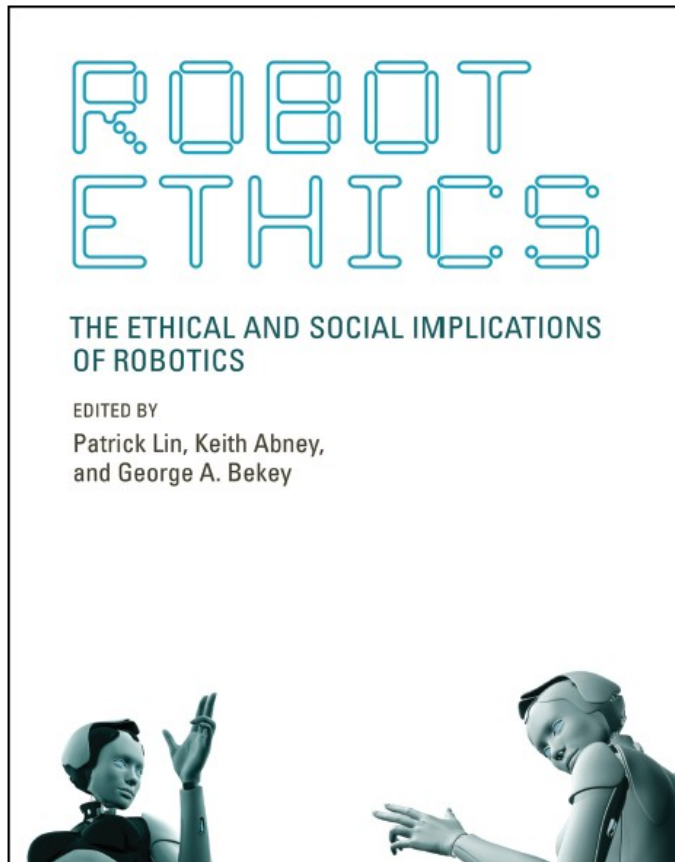
*Even humanities deal with robots*





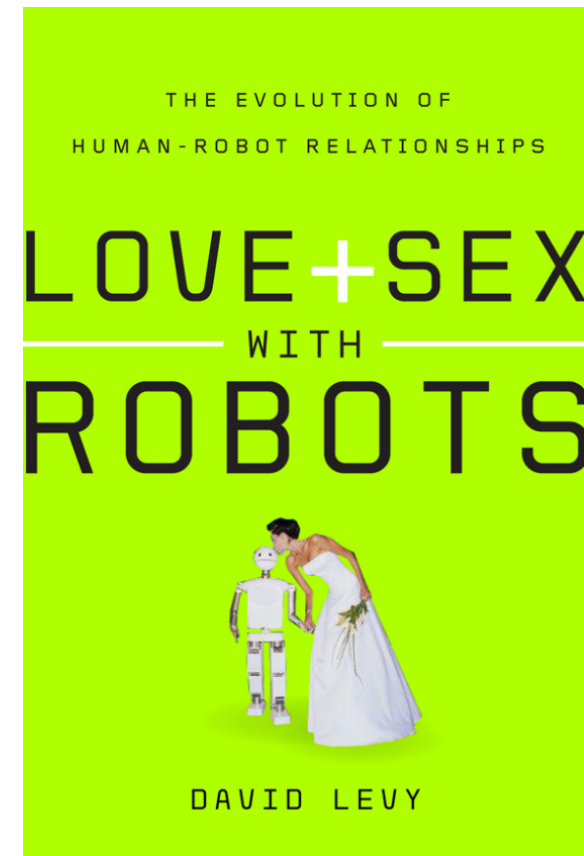
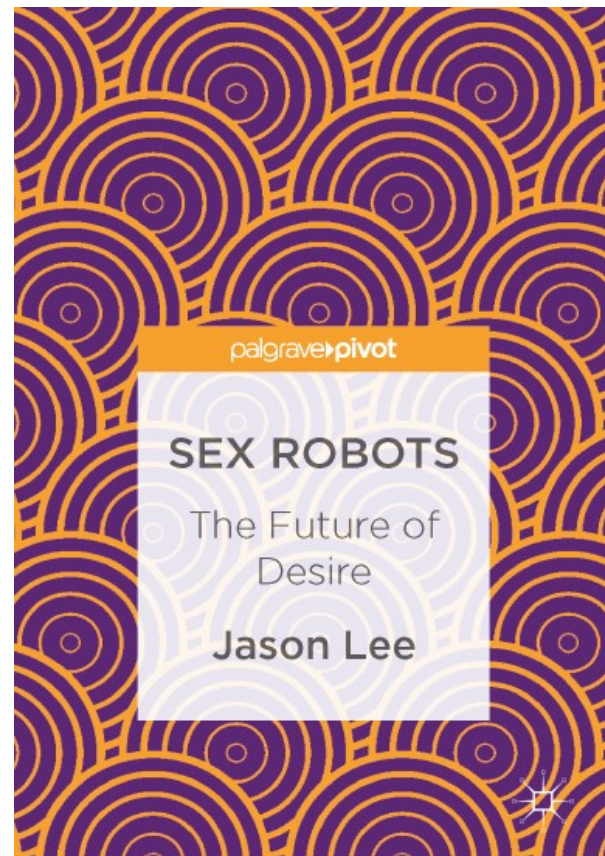
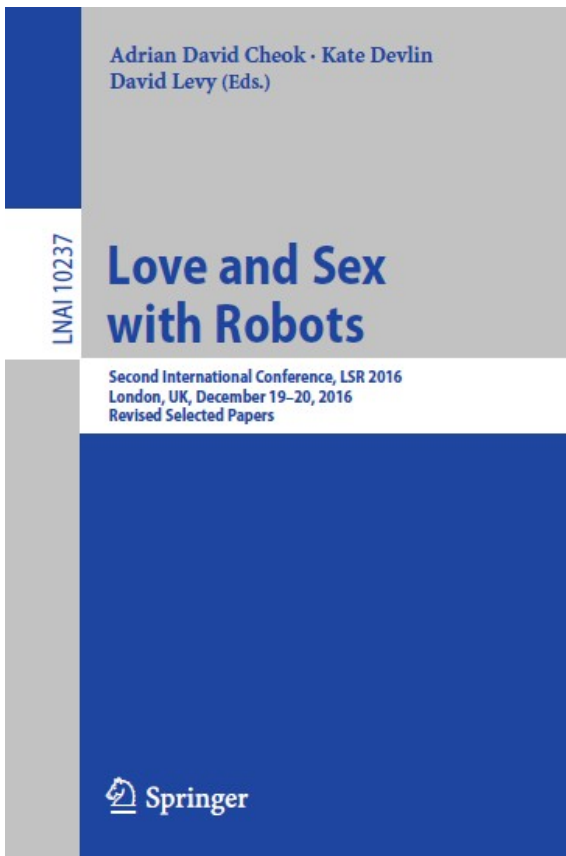
# Prior studies

## *Robot ethics*

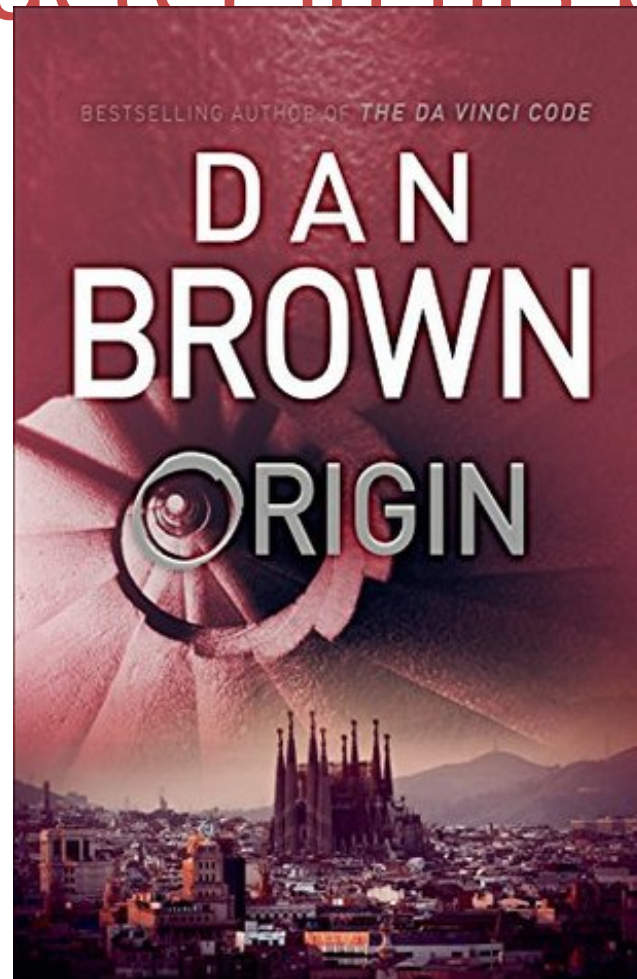


# Prior studies

## *Sex with robots*



Even Dan Brown incorporated artificial intelligence as a character in his book!





Robonomics  
is inevitable



## PREPARING FOR THE FUTURE OF ARTIFICIAL INTELLIGENCE

Executive Office of the President  
National Science and Technology Council  
Committee on Technology

October 2016



## THE NATIONAL ARTIFICIAL INTELLIGENCE RESEARCH AND DEVELOPMENT STRATEGIC PLAN

National Science and Technology Council  
Networking and Information Technology  
Research and Development Subcommittee

October 2016



## The Next Production Revolution

IMPLICATIONS FOR GOVERNMENTS AND BUSINESS

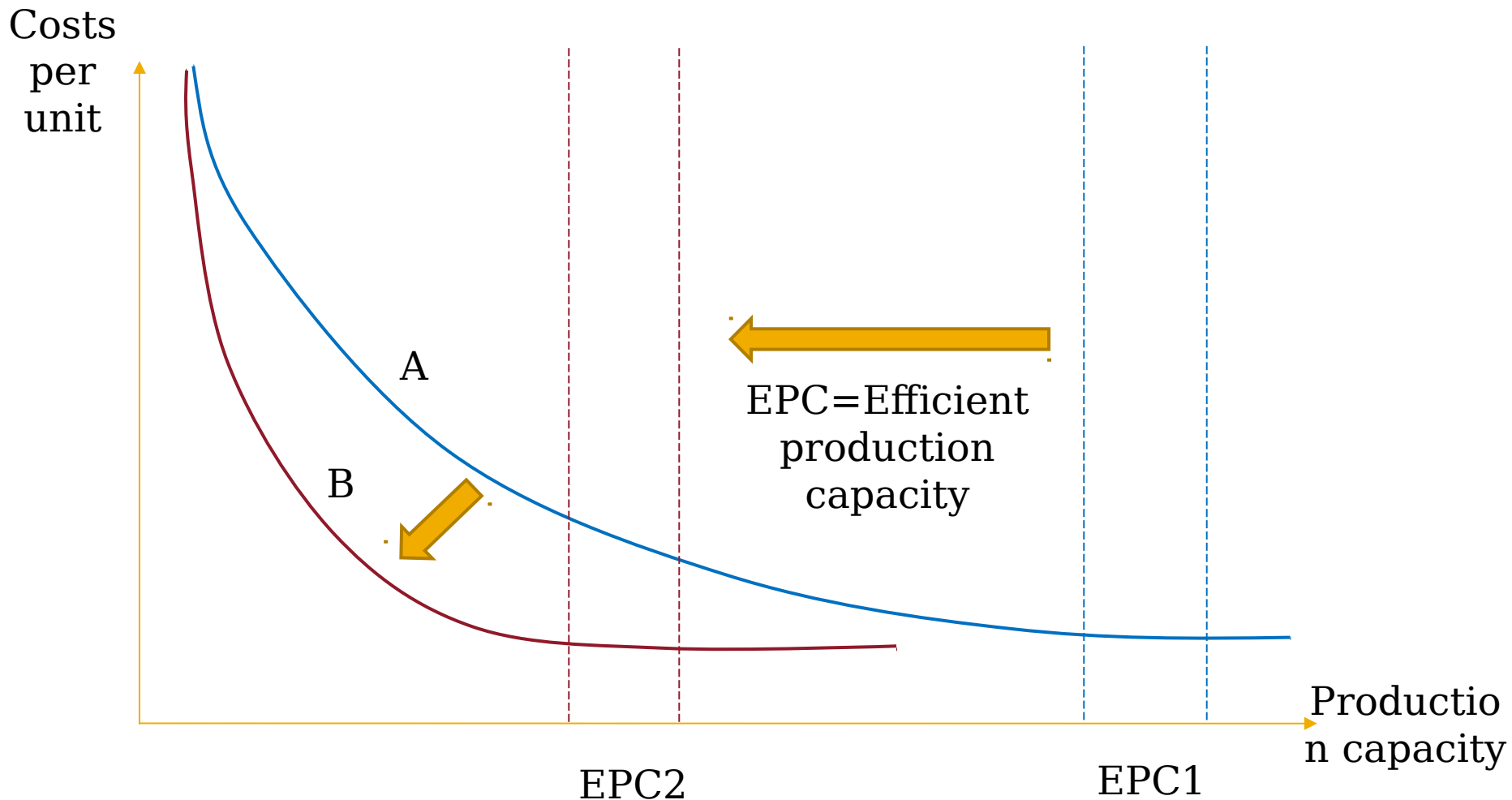


# Principles of Robonomics

# Principles of *Robonomics* (1)

- High level of automation
- Active use of variety of single- and multi-purpose industrial, service and social robots
- All or most of the products (goods and services) are produced / provided by robots, artificial intelligence and automation technologies
- High cost-efficiency of production – economically efficient on-demand single/few unit(s) production of some goods
- Small and dispersed factories, close to consumers (reshoring)

# Principles of *Robonomics* (2)





# Principles of *Robonomics* (3)

- High level of standardisation of services – strict algorithmisation of service provision
- Labour and capital abundance are not competitive advantages, but knowledge and creativity
- Fewer but more knowledge-intensive jobs
- Disconnection between employment and incomes - employment is not the major source of incomes

# Drivers of Robonomics

# Drivers of *Robonomics*

**Macroenvironmental factors**

**Microenvironmental factors**

**Corporate level factors**

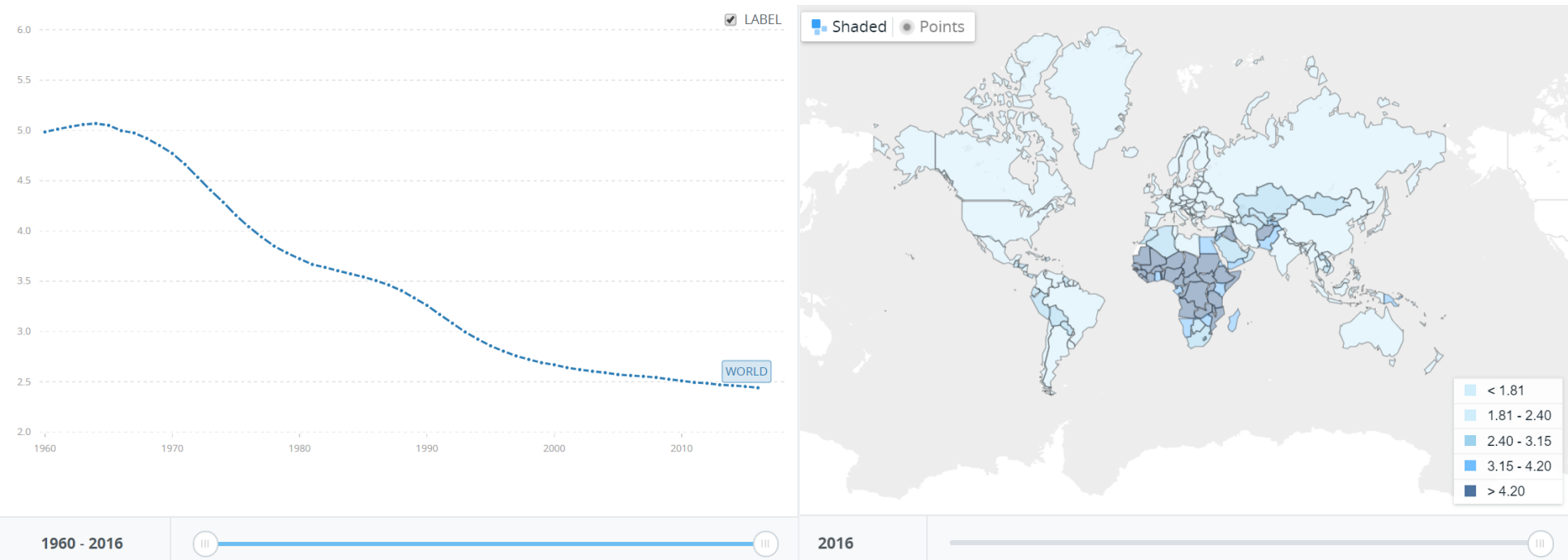
**Psychological factors**

# Drivers of *Robonomics*

## *Macroenvironmental factors*

- Demography:
  - Aging population > disruptions in the labour market

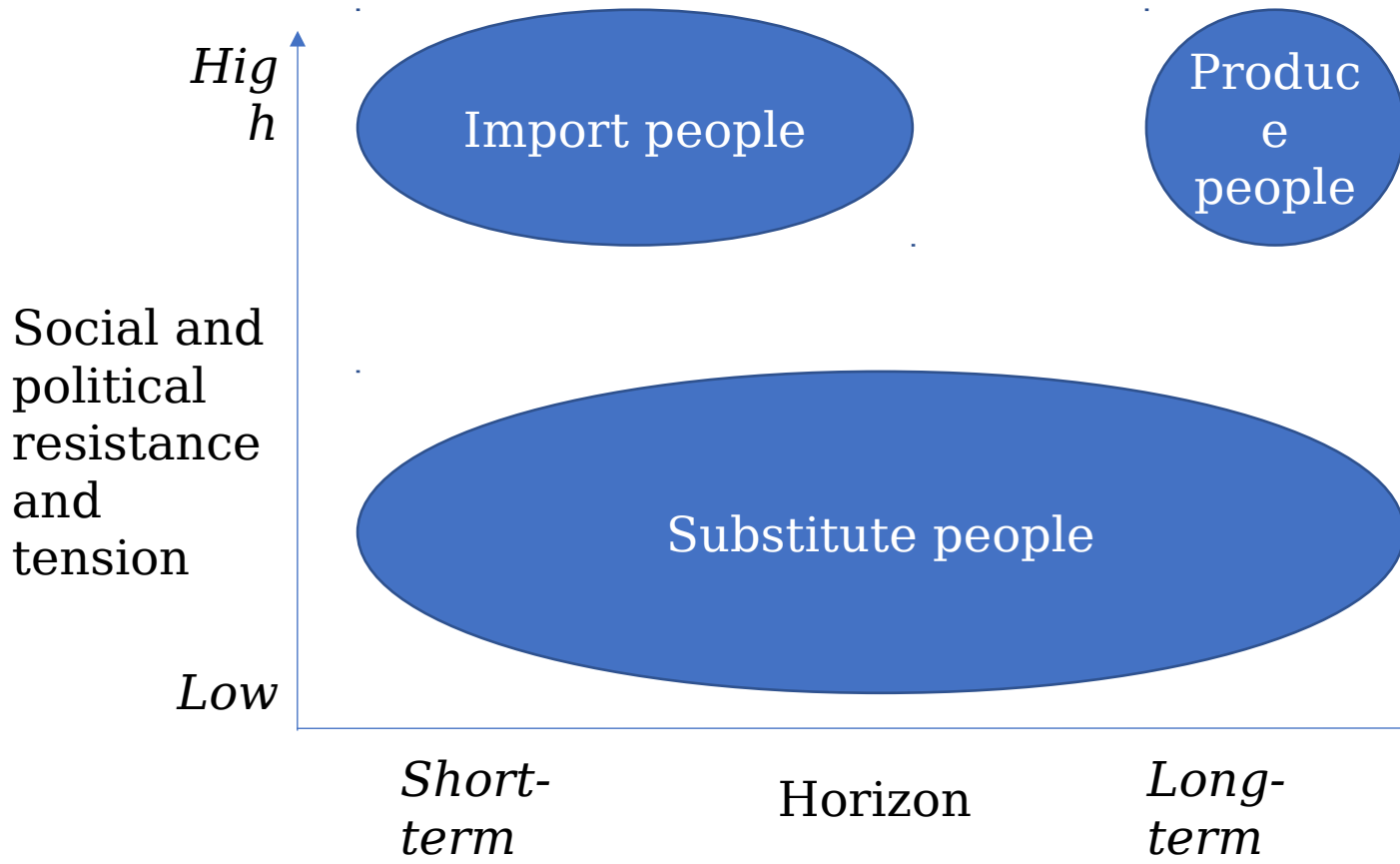
*Number of children per woman (1960-2016)*



# Drivers of *Robonomics*

## *Macroenvironmental factors*

### *Solutions to plummeting populations*





# Drivers of *Robonomics*

## Macroenvironmental factors

- Politics:
  - Governmental control on populations

BUSINESS  
INSIDER



**China has started ranking citizens with a creepy 'social credit' system — here's what you can do wrong, and the embarrassing, demeaning ways they can punish you**

Alexandra Ma Oct. 29, 2018, 12:06 PM



An internet cafe in Wuhan, China. REUTERS/Stringer

- China plans to rank all its citizens based on their "social credit" by 2020.
- People can be rewarded or punished according to their scores.

# Drivers of *Robonomics*

## *Macroenvironmental factors*

- Technology:
  - Advances in RAIA technologies
- Legal framework:
  - Antidiscrimination laws
  - Labour laws
  - Taxation
- Culture and society:
  - Attitudes towards RAIA technologies

# Drivers of *Robonomics*

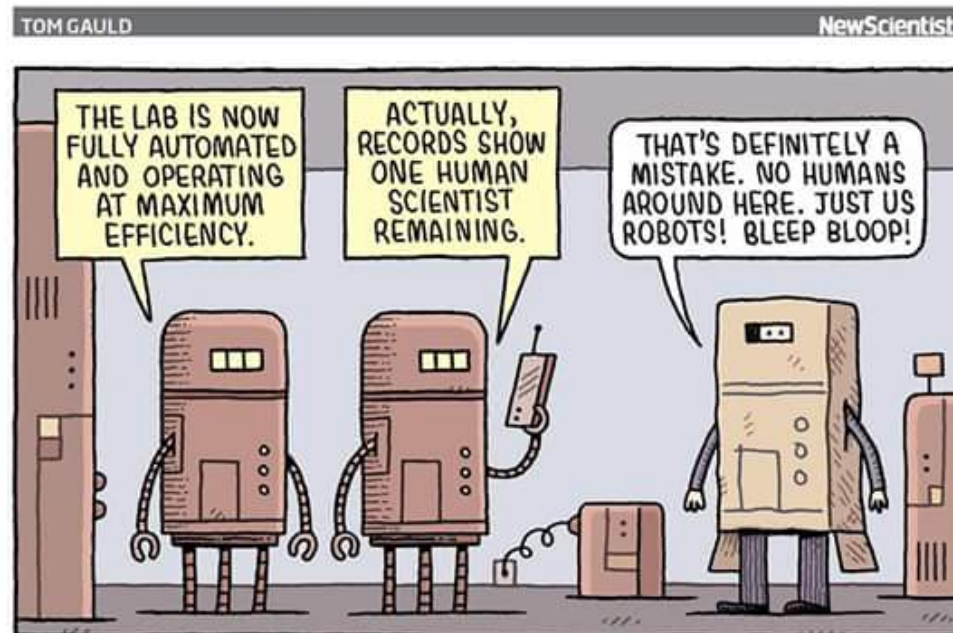
## *Microenvironmental factors*

- Labour market:
  - Lack of sufficient and qualified human employees
- Competitive pressure:
  - Adoption of RAIA technologies by competitors
- Customers:
  - Acceptance of RAIA technologies

# Drivers of *Robonomics*

## *Corporate level factors*

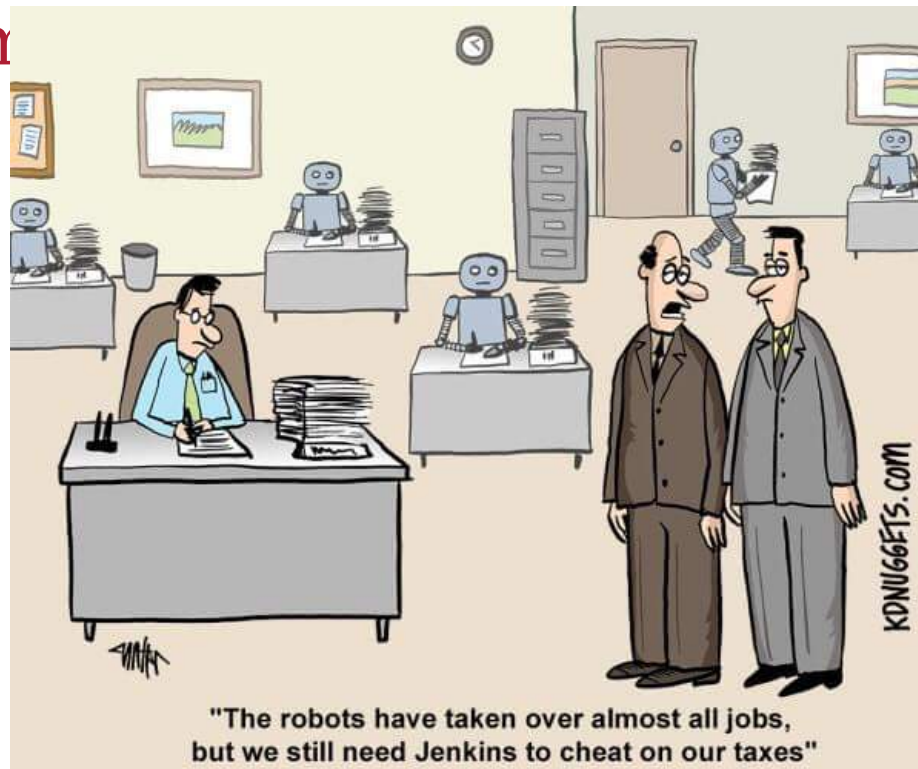
- Economic efficiency:
  - Cost efficiency
  - Productivity
  - Operations management



# Drivers of *Robonomics*

## *Psychological factors*

- Preferences:
  - Managers' preferences towards the use of robots/automation technologies instead of human employees





# Advent of Robonomics

# Advent of *Robonomics*

Stage	Description
Stage 1	Adoption of RAIA by individual companies in an industry
Stage 2	Spread of RAIA among companies in an industry
Stage 3	Gradual spread of RAIA among industries and countries
Stage 4	Spill-over effects of RAIA from developed to developing economies in the form of substituting low-cost labour in developing countries for automated factories in developed economies and bots

# Benefits of Robonomics

# Benefits of *Robonomics*

## *Short-term*

- Decrease in costs and prices
- Improved environmental sustainability of production
- Short-term increase in birth rates

# Benefits of *Robonomics*

## *Long-term*

- Improved quality of life in the long term due to:
  - People are liberated of hard manual labour
  - Drastic increase of leisure time
  - Time for creative and pleasure activities
  - Less (no) work-related stress
  - Improved health
  - Increased life expectancy
- Global government and global citizenship
- Accelerated space exploration



# Challenges of Robonomics

# Challenges of *Robonomics*

## *Short- and mid-term*

- Unemployment and relative overpopulation – fewer human employees and lower salaries:
  - ✓ Frey & Osborne (2017) assess the probability of computerisation for 702 detailed occupations in the USA and conclude that 47% of total jobs in the country are risk of being substituted by AI.
  - ✓ DeCanio (2016) measures the elasticity of substitution of human labour with robots in the USA and concludes that it would lead to significant drop in wages.

# Challenges of *Robonomics*

## *Short- and mid-term*

- Psychological problems of people who find themselves with too much free time, nothing to do and no need to work => recipe for political revolutions
- Fear, social unrest and political instability
- Migration
- Wars

# Challenges of *Robonomics*

## *Long-term*

- Possible functional illiteracy – humans may forget how to do things once robots and automation technologies do them



*“Does your car have any idea why  
my car pulled it over?”*

# Challenges of *Robonomics*

## *Long-term*

- Division of society between employed and unemployed
- Changes in social values – is human life valuable? Do we need other people to satisfy our needs when we have robots?
- Possible significant decrease in population in the long-term



# Solutions to the challenges of Robonomics

# Proposed solutions to the challenges of *Robonomics*

Prior literature has elaborated on some solutions to technological unemployment like *mandating employment, government job creation, work sharing, employment impact statements, tax policies and financial incentives for job creation*, etc. (e.g. Stevens & Marchant, 2017). These solutions assume that given the right stimuli the economy will create enough jobs to keep full employment. However, they may work on the *road to* robonomics as tools to mitigate the impacts of technological unemployment, but not *during* robonomics when society reaches full robotisation of economy and people do not need to work.

# Proposed solutions to the challenges of *Robonomics*

- Constant and fluid free life-long education
- Entertainment
- Tourism and leisure activities
- Volunteering
- Robot-based taxation
- Universal basic income (Basic income guarantee)
- Birth control / birth right patent
- Redefinition of human rights

# Proposed solutions to the challenges of *Robonomics*

## *Universal Basic Income*

### Advantages:

- Provides income for all people in a society and serves as a social safety net
- Easy to administer

# Proposed solutions to the challenges of *Robonomics*

## *Universal Basic Income*

### Disadvantages:

- Requires a lot of resources to finance, which at the absence of or limited proceeds of income taxes (due to the fewer number of people working) may be difficult to finance
- May suppress many people's stimuli to work and improve their skills, thus making them permanently unemployable
- Migration and subsequent social tension if UBI is introduced in one or few countries only without strict migration control

# Proposed solutions to the challenges of *Robonomics*

## *Robot tax*

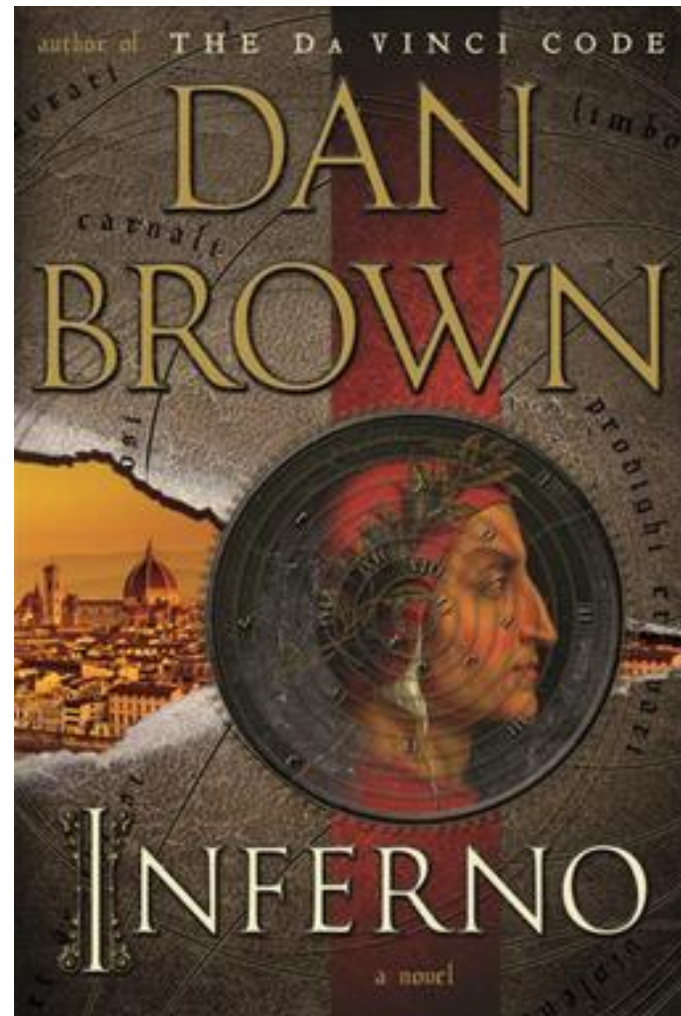
QUARTZ

**The robot that takes your job should pay taxes, says Bill Gates**





# Proposed solutions to the challenges of *Robonomics*



# Proposed solutions to the challenges of Robonomics

## Redefinition of human rights



**1.** Recognition of the inherent dignity and of the equal and inalienable rights of all members of the human family is the foundation of freedom, justice and peace in the world.

**2.** Recognition and respect for human rights have resulted in freedom and belief and freedom from fear and want has been proclaimed as the highest aspiration of the common people.

**3.** It is essential, if man is not to be compelled to have recourse, as a last resort, to rebellion against tyranny and oppression, that human rights should be protected by the rule of law.

**4.** It is essential to promote the development of friendly relations between nations.

**5.** The people of the United Nations have in the Charter proclaimed their faith in fundamental human rights, in the dignity and worth of the human person and in the equal rights of men and women and have determined to promote social progress and better standards of life in larger freedom.

**6.** Member States have pledged themselves to achieve, in co-operation with the United Nations, the promotion of universal respect for and observance of human rights and fundamental freedoms.

**7.** It is a common understanding of the rights and freedoms in of the present instrument for the full realization of this pledge.

**8.** It is the common conviction that the Universal Declaration of Human Rights is a common standard of achievement for all peoples and all nations, in the and that every individual and every organ of society, keeping this Declaration constantly in mind, shall strive by teaching and education to promote respect for these rights and freedoms and by progressive measures, national and international, to secure their universal and effective recognition and observance, both among the peoples of Member States themselves and among the peoples of territories under their jurisdiction.

**9.** Every human being has the right to life, liberty and security.

**10.** No one shall be subjected to arbitrary arrest, detention or exile.

**11.** Everyone has the right to a fair and public hearing in the determination of his rights and obligations in any legal proceedings of which he may be a party.

**12.** No one shall be subjected to arbitrary interference with his privacy, family, home or correspondence, nor to attacks upon his honour and reputation. Everyone has the right to the protection of the law against such interference or attacks.

**13.** Everyone has the right to free movement and residence within the frontiers of each State.

**14.** Everyone has the right to leave any country, including his own, and to return to his country.

**15.** No one shall be subjected to arbitrary deprivation of his nationality.

**16.** Everyone has the right to marry and to found a family, which is the natural basis of society.

**17.** Everyone has the right to own property alone as well as in association with others.

**18.** Everyone has the right to freedom of thought, conscience and religion; this right includes freedom to change his religion or belief.

**19.** Everyone has the right to freedom of opinion and expression; this right includes freedom to hold opinions without restriction and to receive and impart information and ideas without restriction by frontiers, by censorship or by any other restriction of propaganda.

**20.** Everyone has the right to peaceful assembly and association with others, this right includes the right to form and to join trade unions for the protection of his interests.

**21.** Everyone has the right to take part in the government of his country, directly or through freely chosen representatives.

**22.** Everyone has the right to social security, and, through national effort and international co-operation, the realization of the economic, social and cultural rights and freedoms stated in this Declaration.

**23.** Everyone has the right to work, to free choice of employment, to just and favourable conditions of work, to protection of employment, to higher pay for more complex labour, to unionization and to the right to strike.

**24.** Everyone has the right to rest and leisure, including reasonable limitation of working hours and periodic holidays with pay.

**25.** Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing, medical care and social services, and the right to the highest attainable standard of physical, mental and social well-being.

**26.** Everyone has the right to education. Education shall be free, at least in the elementary and fundamental stages. Elementary education shall be compulsory. Technical and vocational education shall be made generally accessible and higher education shall be open to all on the basis of merit.

**27.** Everyone has the right to the free enjoyment of his cultural life, to the use of his own language, to education that shall promote the most profound knowledge and understanding of the civilizations of his own and other peoples, and to the education that shall promote respect for the rights and freedoms of all.

**28.** Everyone has the right to a social and international order in which the rights and freedoms stated in this Declaration can be fully realized.

**29.** Everyone has duties to the community in which alone the free and full development of his personality is possible.

**30.** Nothing in this Declaration shall be interpreted as authorizing any State, group or person to engage in any activity that would defeat the purposes and principles of the Declaration.



<https://render.fineartamerica.com/images/rendered/default/poster/8/10/break/images/artworkimages/medium/1/declaration-of-the-rights-of-man-and-citizen-french-school.jpg>

<http://www.un.org/sites/www.un.org/files/2015/10/07/universal-declaration-human-rights.jpg> [stanislavivanov.com](http://stanislavivanov.com)

# Proposed solutions to the challenges of *Robonomics*

## *Redefinition of human rights*

Situation	Biological right (reproduction)	Political right (voting)	Economic right (basic income)	Outcome
1	Yes	Yes	Yes	Country default
2	Yes	Yes	No	Mass poverty
3	Yes	No	Yes	Country default
4	Yes	No	No	Mass poverty
5	No	Yes	Yes	Demographic crisis
6	No	Yes	No	Demographic crisis
7	No	No	Yes	Demographic crisis
8	No	No	No	Demographic crisis

# Proposed solutions to the challenges of *Robonomics*

## *Redefinition of human rights*

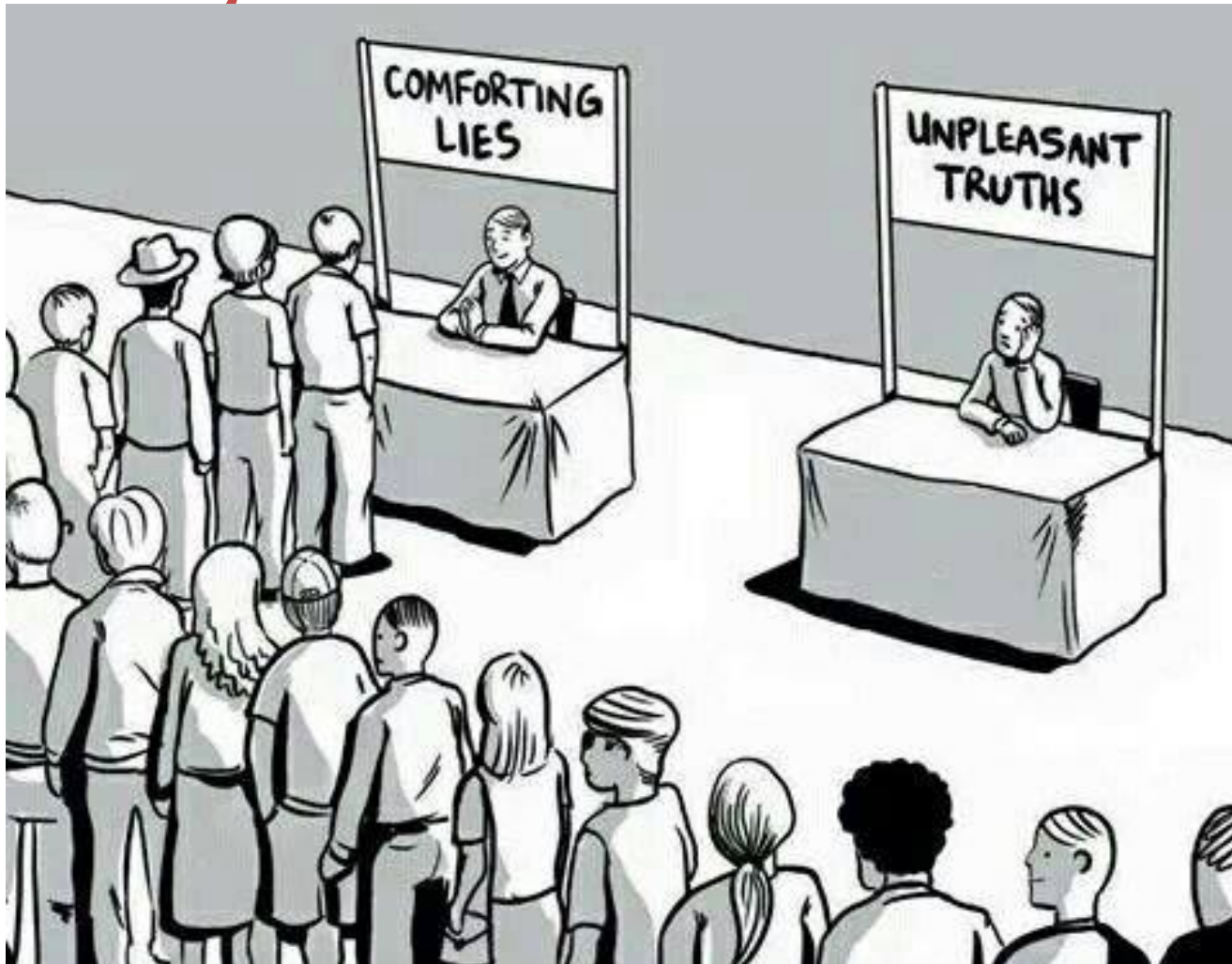
Situation	Biological right (reproduction)	Political right (voting)	Economic right (basic income)	Outcome
2	Yes	Yes	No	Mass poverty
7	No	No	Yes	Demographic crisis

[7] provides a stable solution

- ✓ People self-select whether they want the cozy life without work, but subject to sterilization and without the right to vote, OR they will not receive any guaranteed income but will have the right to vote and reproduce



# Proposed solutions to the challenges of *Robonomics*



Robots, AI and automation technologies have arrived and are here to stay.

Prepare ...

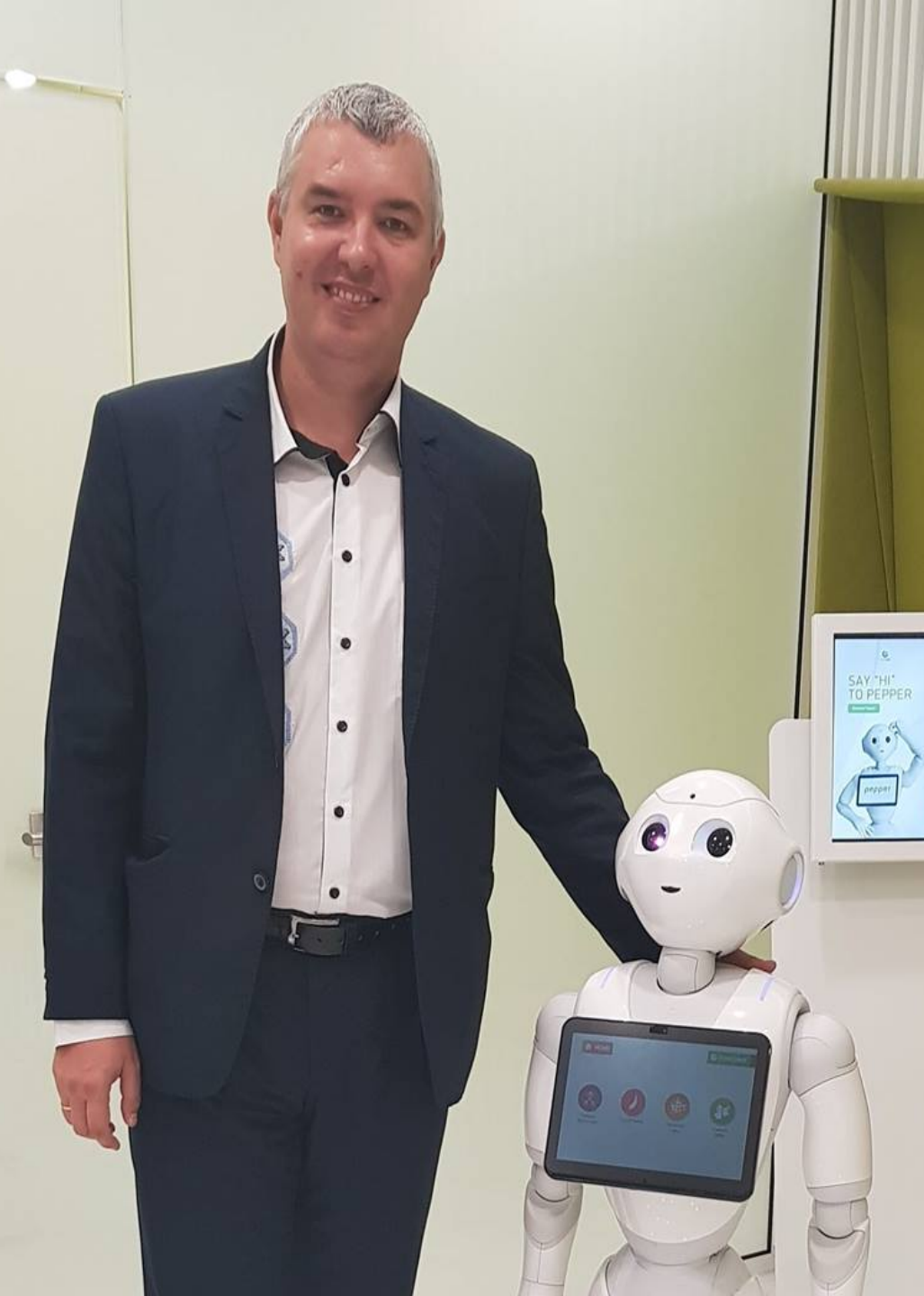


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THANK YOU  
FOR THE  
ATTENTION

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QUESTIONS

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