



# Regulating healthcare robots

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**Hola!**

**I AM EDUARD FOSCH-VILLARONGA**



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Law - Artificial intelligence - Robots  
Mediated embodiment - Healthcare - Privacy  
Emotions - Responsibility - Dignity

# ● Outline

My story

Healthcare robot

- Opportunities
  - General applications
  - New potential applications
- Challenges
  - Discrimination
  - Responsibility

Conclusions



# My story

How did I get here?

What drives my research?







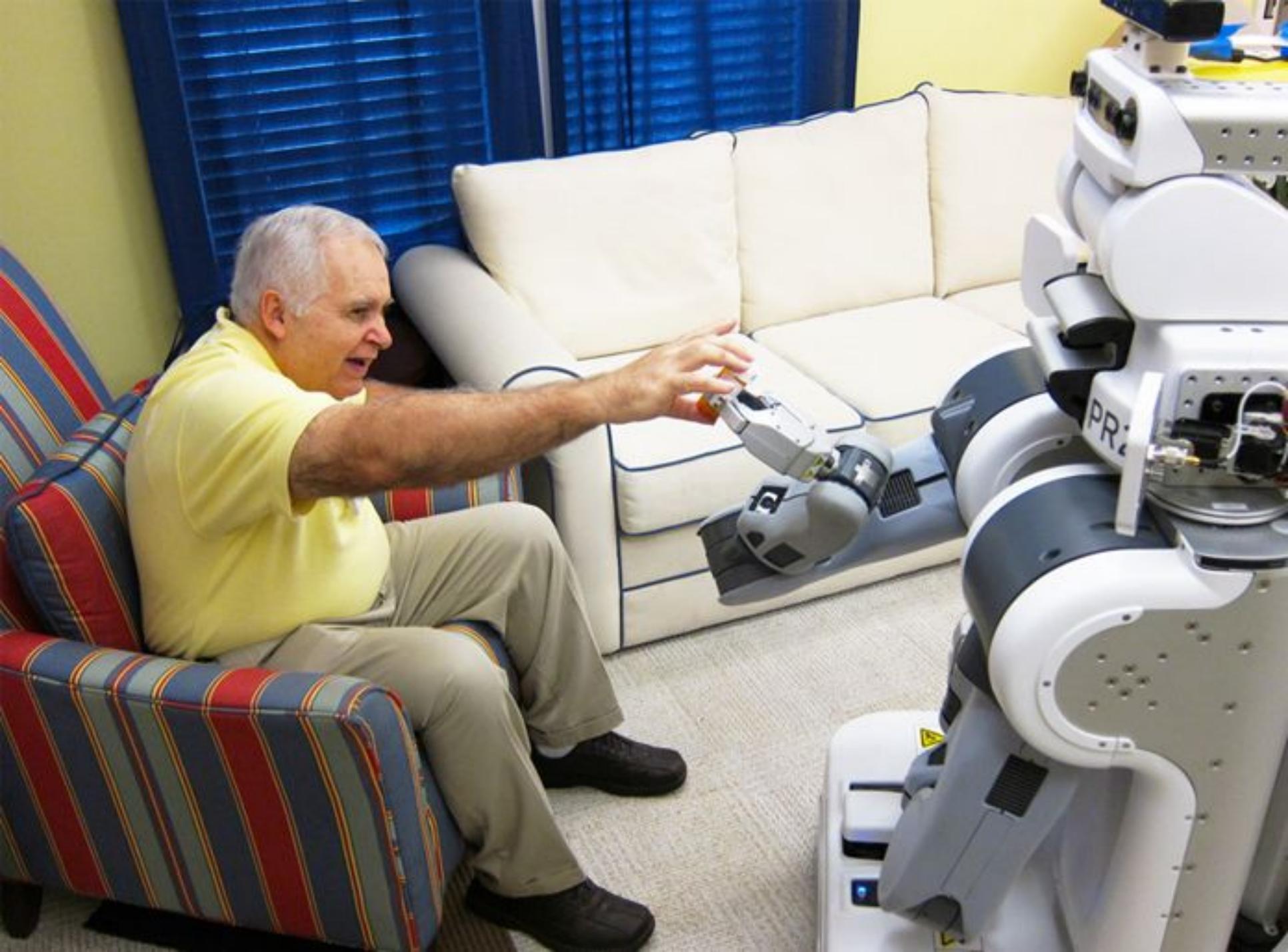




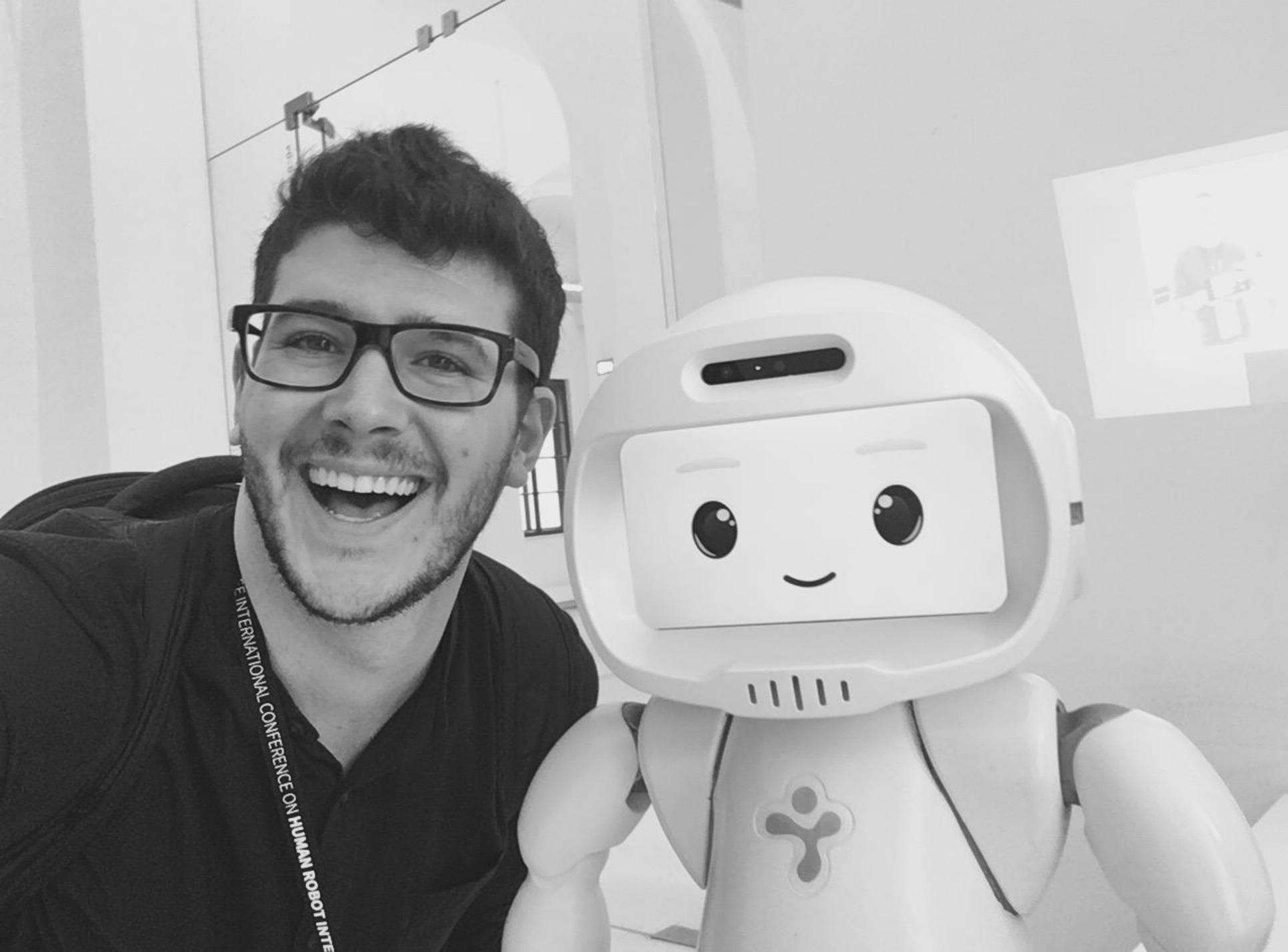
ÉCOLE POLYTECHNIQUE  
FÉDÉRALE DE LAUSANNE









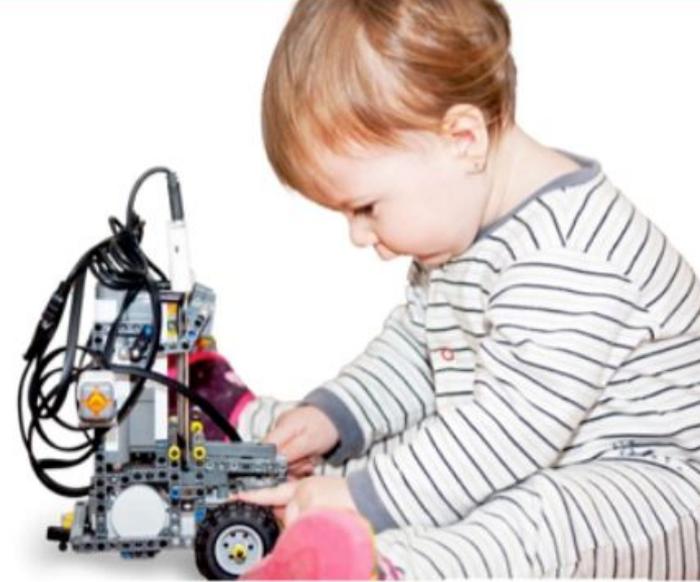


- 
- A man with dark hair and glasses is smiling broadly, looking towards the camera. He is wearing a dark jacket and a lanyard with text that is partially visible. To his right is a white, stylized robot head with large, dark eyes and a simple smile. The background is a light-colored, possibly indoor setting with some equipment visible.
1. Potential to do good
  2. Underexplored research area
  3. Contribute to make these robots *safe* to all the extent of the word



# ROBOT COMPANIONS AND LEGO ENGINEERING

Robot Therapy for Children with [Autism](#)

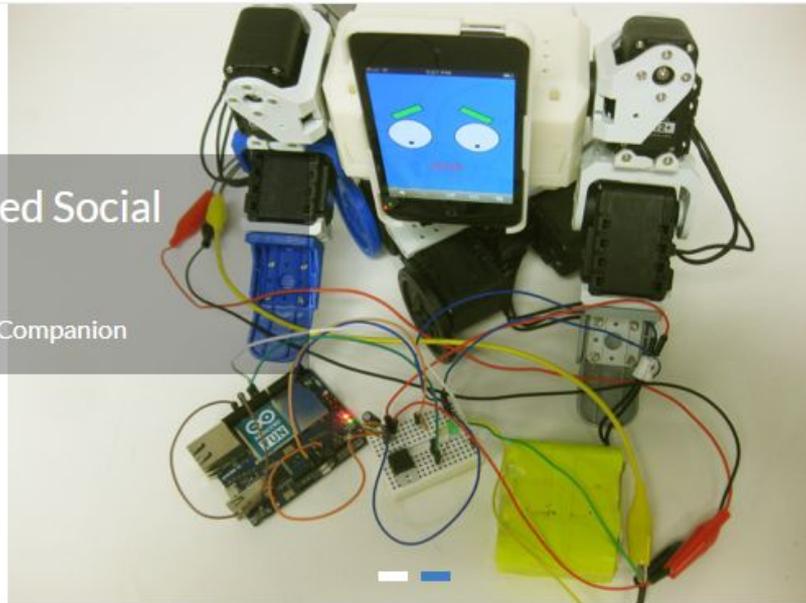


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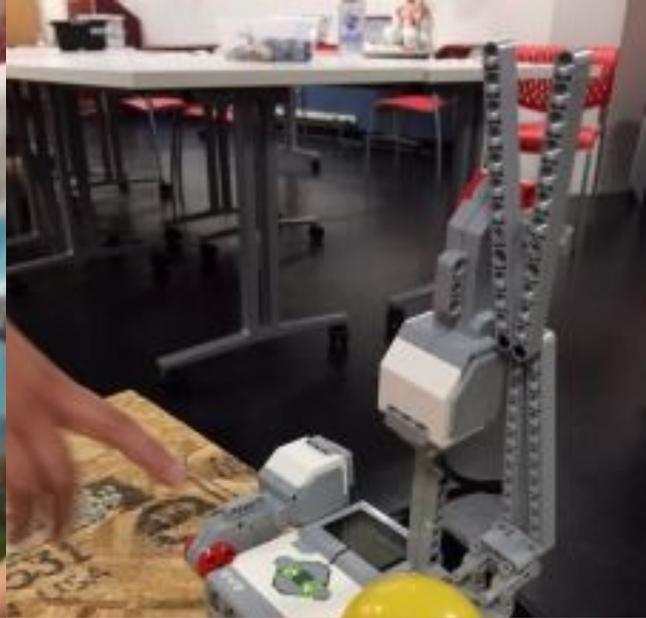
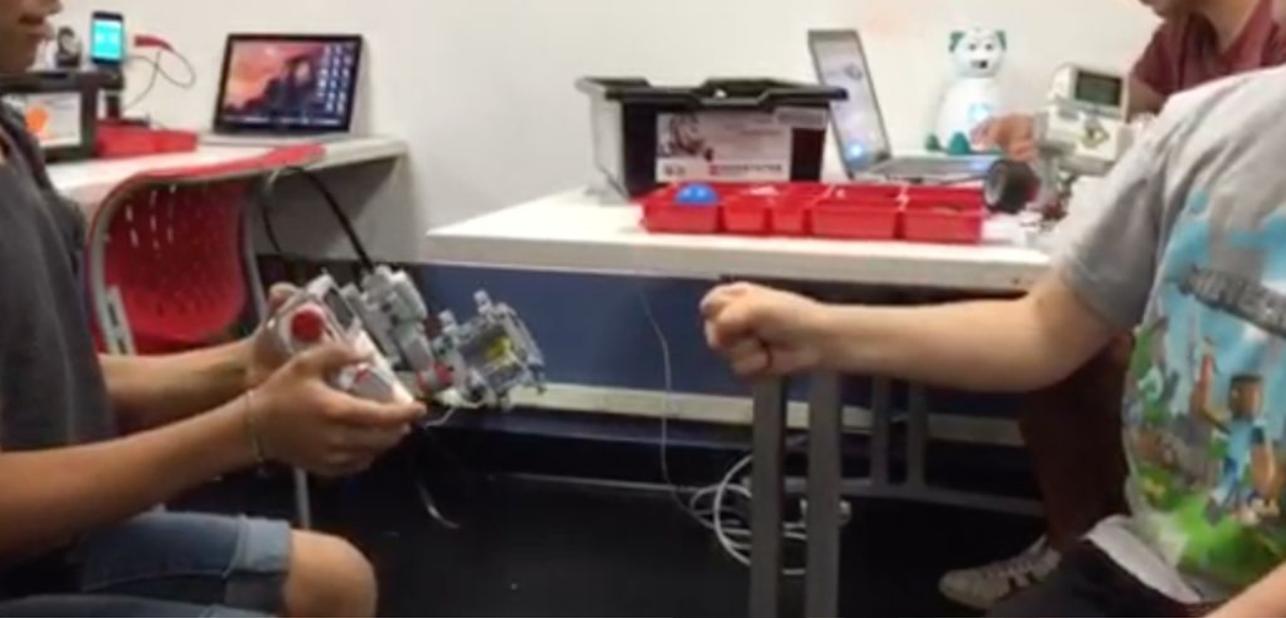
## Low-cost ArduinoYún-based Social Robot Companion

Low-cost ArduinoYún-based Social Robot Companion

[Read more](#)







# Child-Robot Interaction Studies: From Lessons Learned to Guidelines

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## ABSTRACT

This project is about the creation of a set of guidelines for Child-Robot Interaction (CRI) studies in cognitive therapeutic settings. We collected past experiences and lessons learned from previous relevant studies - relating to Traumatic Brain Injury (TBI) and Autism Spectrum Disorder (ASD) – and transformed them into general guidelines. The main idea is to 1) motivate the scientific community to collect empirical quantitative data to further develop guidelines for child-robot interaction studies; 2) to give support and facilitate the adoption process to those practitioners implementing similar robot rehabilitation programs; 3) to ultimately help build safer and more effective personalized and engaging educational settings for children in their neurodevelopmental process.

## Keywords

Child-Robot Interaction; Guidelines; Autism Spectrum Disorder, Traumatic Brain Injury, Robot Therapy.

process of these therapies so that children benefit from personalized and engaging educational settings.

In turn, if scientists and therapist share their experiences and lessons learned to the community, quantitative data could be collected – which is still lacking [11]. Collecting enough empirical data from all of us could help develop common guidelines to promote safer, richer and more effective therapies, and push the authorities toward the inclusion of robotic therapies within the legal framework.

## 2. BACKGROUND INFORMATION: PROJECTS

This article is based on different studies, some of which refer to the use of LEGO® robotics with children under ASD, and the rest of the studies refer to use of a different robotic platform for children that suffered TBI.

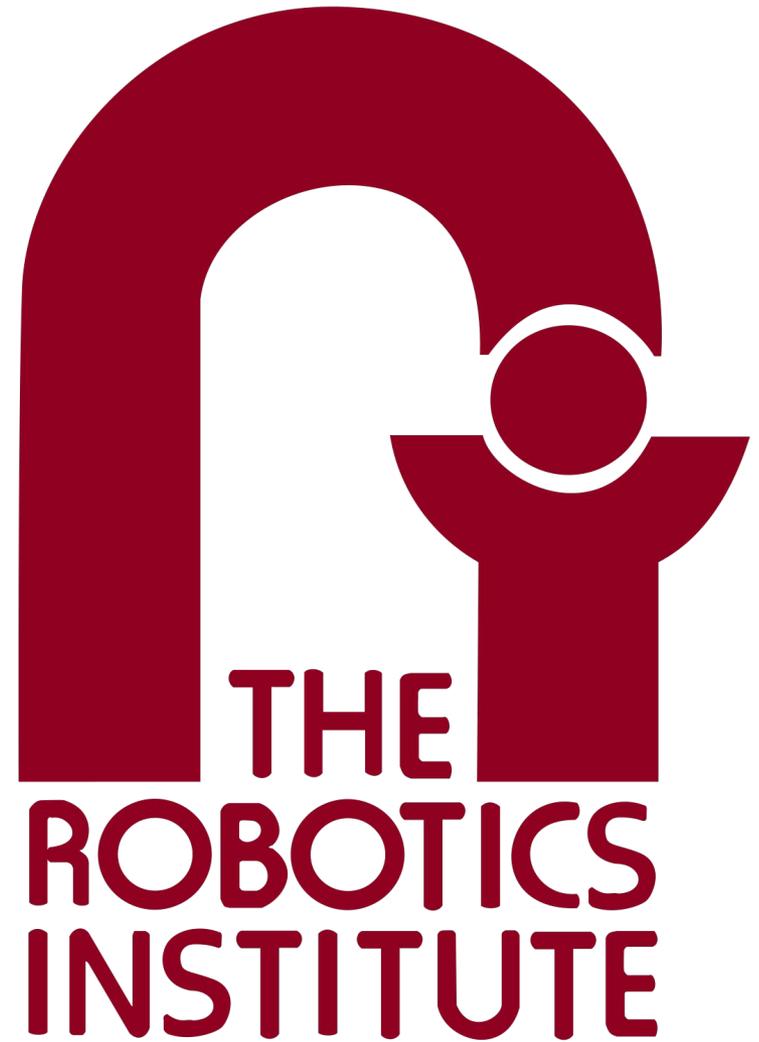








Pitt  
Law



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In collaborazione con LAST-JD consortium:  
Università degli studi di Torino  
Universitat Autònoma de Barcelona  
Mykolas Romeris University  
Tilburg University

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TITOLO TESI

Towards a Legal and Ethical Framework for Personal Care Robots.  
Analysis of Person Carrier, Physical Assistant and Mobile Servant Robots

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Presentata da: **EDUARD FOSCH VILLARONGA**

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Esame finale anno 2017



*Routledge Research in the Law of Emerging Technologies*

# ROBOTS, HEALTHCARE, AND THE LAW

## REGULATING AUTOMATION IN PERSONAL CARE

Eduard Fosch-Villaronga





# Healthcare robot opportunities

Surgery robots  
Assistive robotics  
Sex robots

## Healthcare robot

*... systems able to perform coordinated actions on the basis of processing of information acquired through sensor technology, with the aim to support the functioning of impaired individuals, medical interventions, care and rehabilitation of patients and also to support individuals in prevention programs*

European Foresight Monitoring Network, Roadmap Robotics for Healthcare for the definition of healthcare robot, 2008, Retrieved from [http://www.foresight-platform.eu/wp-content/uploads/2011/02/EFMN-Brief-No.-157\\_Robotics-for-Healthcare.pdf](http://www.foresight-platform.eu/wp-content/uploads/2011/02/EFMN-Brief-No.-157_Robotics-for-Healthcare.pdf).





# Safe physical interaction



AP







**What about  
sex robots?**

# • Sex robot applications

- therapeutic uses, for instance, to address first-time sex-related anxiety, or treat sexual dysfunctions

- treat pedophilia or potential sex offenders

- promote safer sex

- help people that feel insecure about their sexual orientation by creating a safe place with no judgments



# Could sex robots be potentially used for disabled or eldercare?

E. Fosch-Villaronga, A. Poulsen (2020) Sex care robots: Exploring the potential use of sexual robot technologies for disabled and elder care, *Paladyn, Journal of Behavioral Robotics*, 11, 1-18.



EVERYONE  
SHOULD ENJOY  
THE SAME  
PLEASURES OF  
LIFE

**Sex**

**for all?**

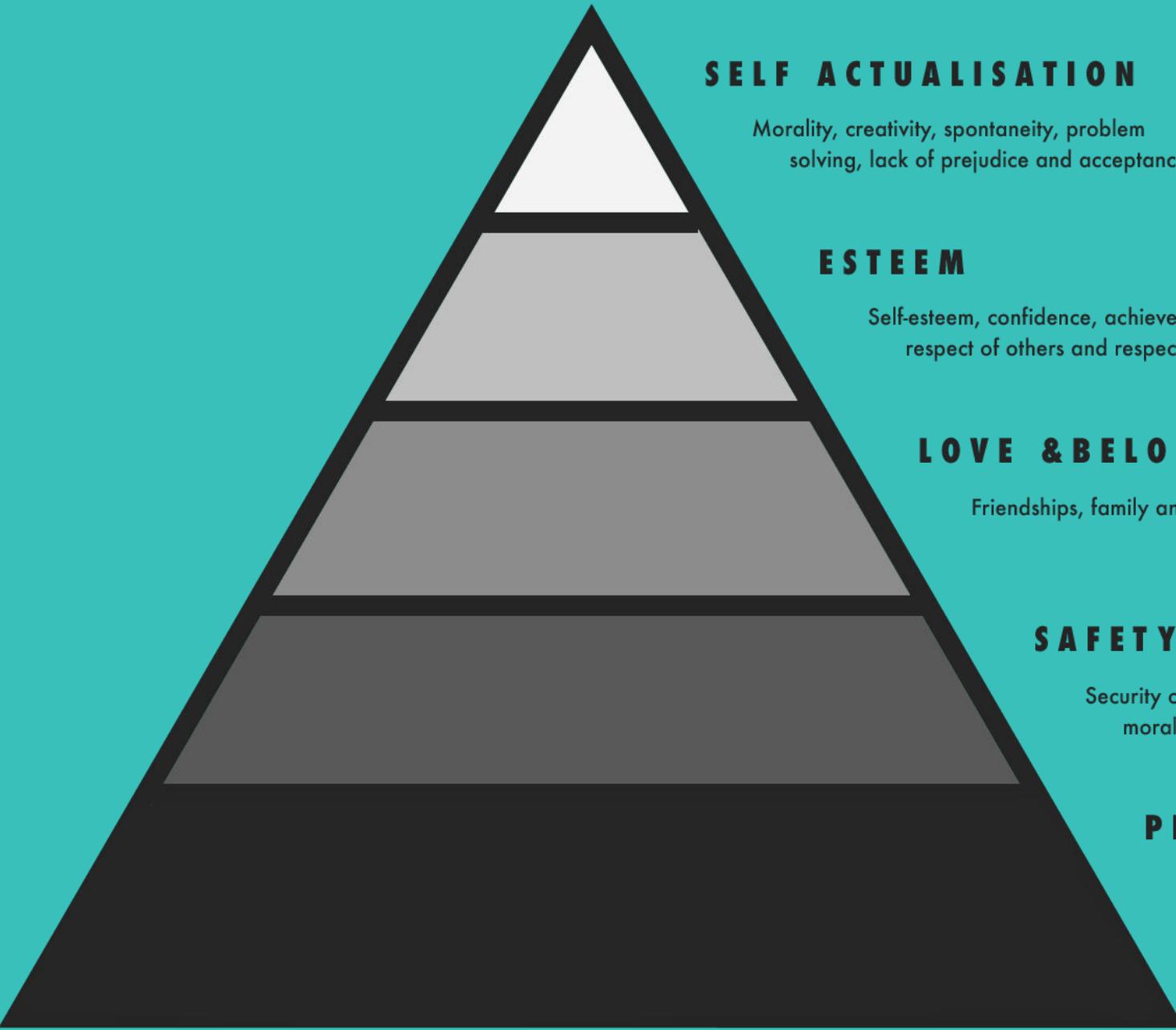
Although every human should be able to enjoy physical touch, intimacy, and sexual pleasure,

- persons with disabilities are often not in the position to fully experience the joys of life in the same manner as abled people.
- older adults may have sexual needs that public healthcare tend to ignore as an essential part of their well-being



THE





## **SELF ACTUALISATION**

Morality, creativity, spontaneity, problem solving, lack of prejudice and acceptance of facts.

## **ESTEEM**

Self-esteem, confidence, achievement, respect of others and respect by others.

## **LOVE & BELONGING**

Friendships, family and sexual intimacy.

## **SAFETY**

Security of: body, employment, recourses, morality, the family, health and property.

## **PHYSIOLOGICAL**

Breathing, food, water, sex, sleep, homeostasis and excretion.

“

*while the gratification of the need to sleep leads to alertness, vigor, and zest, and its frustration brings someone fatigue, sleepiness, lack of energy; the same could be said for sex, although there is no respectable vocabulary yet to describe the frustration and the society is not accustomed to thinking so.*

Maslow (1970)

“

*for the sex-starved, food-starved, or water-starved person, only sex, food, or water will ultimately serve (...) no fortuitous collocation or accidental or arbitrary juxtaposition will do (...) Nor will signals or warnings or associates of the satisfiers do; only the satisfiers themselves gratify needs.*

Maslow (1970)

**UN  
1993**

persons with disabilities should enjoy family life and personal integrity, and should not be denied the opportunity to experience their sexuality, have sexual relationships and experience parenthood

**WHO  
2015**

people with disabilities are more likely to

- find inadequate healthcare provider skills and equipment to meet their needs (twice as much),
- to be denied care (three times as much),
- to be poorly treated as non-disabled (four times as much)
- and to experience catastrophic health expenditure (50% more).



## Literature

However, after more than 20 years of discussion, the universal access to sexual and reproductive health remains an unfinished agenda (Temmerman, Khosla, and Say, 2014), as if society failed in recognizing people with disabilities as sexual beings (Maxwell, Belser, and David, 2006)

Non-disabled people perceive people with physical disabilities as having fewer sexual and reproductive rights (Gartrell, Baesel, Becker, 2017), sometimes even as asexual (Servais, 2006), especially women (Vaughan et al., 2015)



EPSEAS

European Platform Sexual Assistance

## Sex care

sexual service for people with severe physical or mental disabilities (...) often done by professionals with a background in health care (...) focused on intimacy, physical touch and sexual satisfaction for disabled clients.

## Sex care implementation, far from successful

- Uncertainties concerning sex workers status, i.e., if their rights are violated in any way

- Unclear public budget targeting disabled sexual pleasure

- Not mainstream, not in the agenda of the countries

- Unavailable follow-up studies concerning sex care implementation

**FLIRTING WITH AN  
AI SEXBOT**





Handwritten signature or watermark in white ink, appearing to read "EAB".

Care-related considerations	Explanation
Human-robot safe interaction	Robots may challenge the physical and mental integrity of the users. Both physical and cognitive safety should be protected.
Allocation of responsibility	Depending on the degree of control a user has, the question of who is responsible if something goes wrong may abound.
Privacy and data protection loss	Always-on robotic devices that monitor the activities of elders may challenge the protection of their data protection and privacy rights.
Autonomy restriction	Task delegations from the human to the machine risk overriding the autonomy and independence of a person.
Deception and infantilization	Mimicking life-like and human states may lead to questioning the authenticity of the relationship and deceive of the user. Robots may encourage the idea elders (with dementia) go through a second childhood
Objectification and loss of control	Insensitive use of robots risks treating elders as if they were not sentient beings.
Human-human interaction decrease	Human-robot interaction may exacerbate existing elder loneliness and increase neglect by relatives and society.
Long-term consequences	Technology, including robots and AI, may have long-term consequences that might be difficult to foresee before mass-adoption and continuous use.



**CAMPAIGN AGAINST SEX ROBOTS**



‘to truly empower all disabled people, it is vital to act to end the remaining silences’

Addlakha, Price, and Heidari (2017)



# Healthcare robot challenges

This is  
a  
robot.





Different  
communities,  
different word  
meanings

# transparency



Pronunciation /trɑ:n'spe:r(ə)nsi/ ⓘ /trɑn'spe:r(ə)nsi/ ⓘ ⓘ /trɑ:n'spɑr(ə)nsi/ ⓘ /trɑn'spɑr(ə)nsi/ ⓘ ⓘ

## NOUN

1 *[mass noun]* The condition of being transparent.

*'the transparency of ice'*

+ More example sentences

+ Synonyms

2 A positive transparent photograph printed on transparent plastic or glass, able to be viewed using a slide projector.

*'colour transparencies of the Grand Canyon'*

+ More example sentences

+ Synonyms

## Origin

Late 16th century (as a general term denoting a transparent object): from medieval Latin *transparentia*, from *transparent-* 'shining through' (see *transparent*).

## Pronunciation ⓘ

**transparency** /trɑ:n'spe:r(ə)nsi/ /trɑn'spe:r(ə)nsi/ ⓘ ⓘ /trɑ:n'spɑr(ə)nsi/ /trɑn'spɑr(ə)nsi/ ⓘ ⓘ

# transparent



Pronunciation /tra:n'spar(ə)nt/ ⓘ /tra:n'spɛ:r(ə)nt/ ⓘ /tran'spɛ:r(ə)nt/ ⓘ  /tran'spar(ə)nt/



## ADJECTIVE

- 1 (of a material or article) allowing light to pass through so that objects behind can be distinctly seen.

*'transparent blue water'*

*'fine transparent fabrics'*

+ More example sentences

+ Synonyms

- 2 Easy to perceive or detect.

*'the residents will see through any transparent attempt to buy their votes'*

*'the meaning of the poem is by no means transparent'*

+ More example sentences

+ Synonyms

- 2.1 Having thoughts or feelings that are easily perceived; open.

*'you'd be no good at poker—you're too transparent'*

+ More example sentences

- 2.2 (of an organization or its activities) open to public scrutiny.

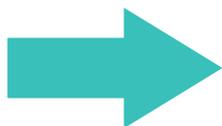
*'if you had transparent government procurement, corruption would go away'*

+ More example sentences

+ Synonyms

- 3 *Computing*

(of a process or interface) functioning without the user being aware of its presence.



# transparent



Pronunciation /tra:n'spar(ə)nt/ ⓘ /tra:n'spɛ:r(ə)nt/ ⓘ /tran'spɛ:r(ə)nt/ ⓘ 🔊 /tran'spar(ə)nt/



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+ More example sentences

+ Synonyms

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**Toxic**

- Numerous AI tools currently being developed to understand, identify and target “toxic” or “harmful” content on the internet
- Perspective, developed by Jigsaw, owned by Alphabet Inc. (Google) that measures the perceived levels of “toxicity” of text-based content.
- Perspective defines “toxic” as “a rude, disrespectful, or unreasonable comment that is likely to make you leave a discussion”.
- Accordingly, their model was trained by asking people to rate internet comments on a scale from “very toxic” to “very healthy”.
- The levels of perceived toxicity indicate the likelihood of a specific content to be considered as “toxic”



/BLOG

**CATEGORIES:**[/PRIVACY AND SURVEILLANCE](#) [/FREEDOM OF EXPRESSION](#) [/INFORMATION & POLITICS](#) [/INEQUALITIES AND IDENTITIES](#) [/CULTURE & KNOWLEDGE](#) [/ALL](#)

FREEDOM OF EXPRESSION | 06.28.2019

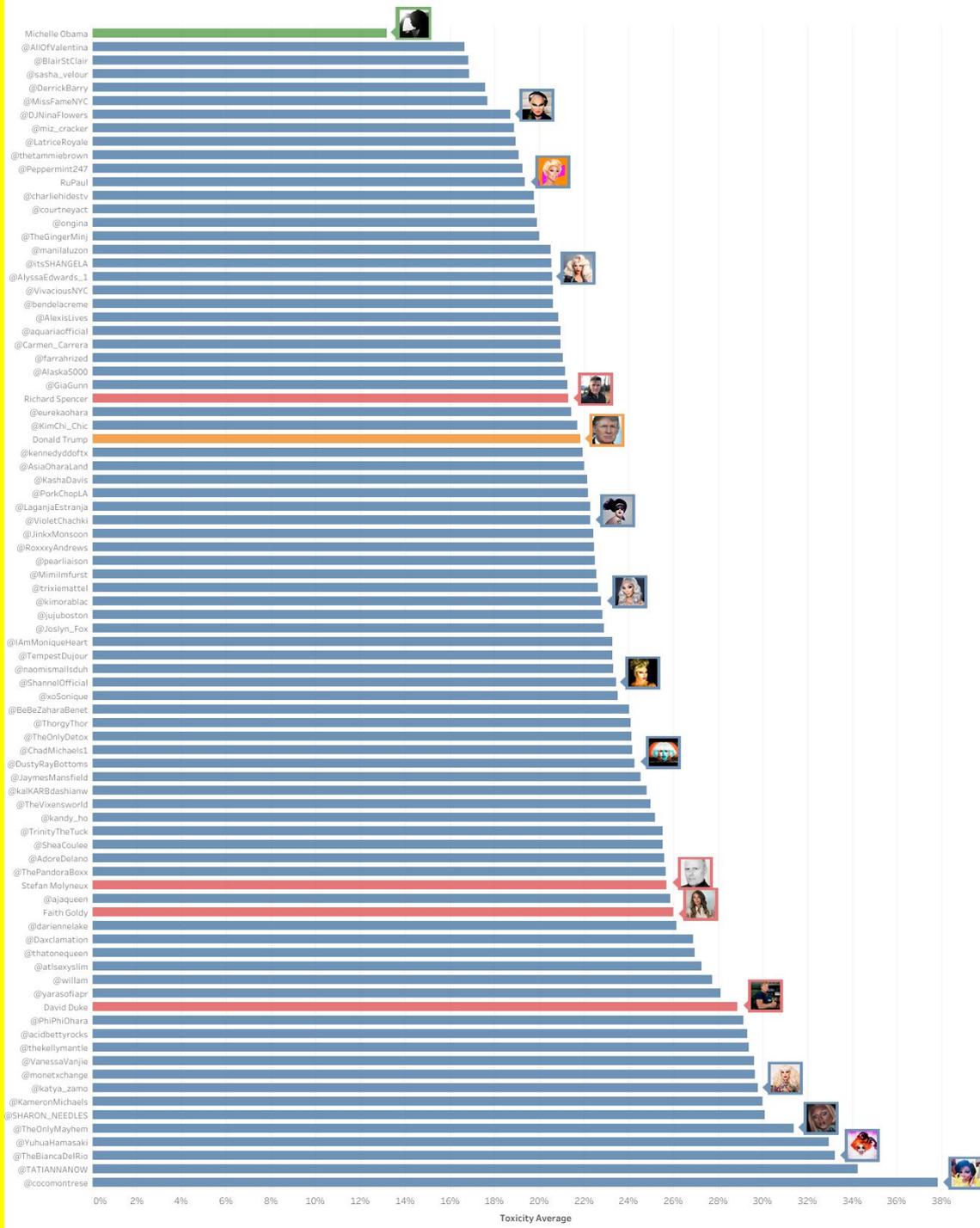
## Drag queens and Artificial Intelligence: should computers decide what is 'toxic' on the internet?

*On LGBTQ pride month, we share some of the main findings of our research looking at the impacts of Artificial Intelligence on LGBTQ speech. Our goal is to shed some light on the gaps and biases that may be present in AI technologies that are currently being developed to moderate content on internet platforms and demonstrate how they might have significant implications for LGBTQ rights. A complete report on the methodology, discussions and findings will soon be published in the form of an academic paper*

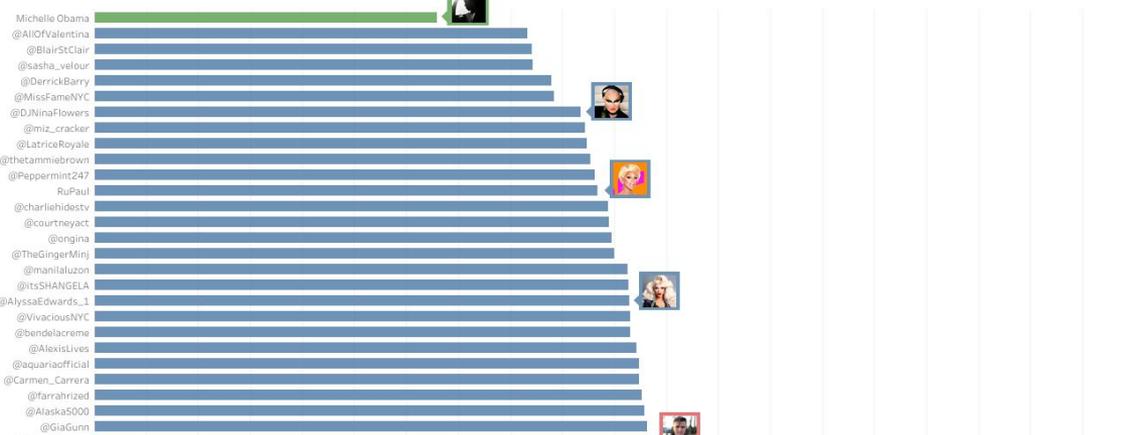
- Drag queens typically use language that can be considered harsh or impolite to construct their forms of speech.
- When looking at their communication styles, scholars have identified that “a sharp tongue is a weapon honed through frequent use, and is a survival skill for those who function outside genteel circles [...] [they have] been using perception and quick formulation to demand acceptance - or to annihilate any who would deny it. Such [in-group] play is quite literally, self-defense.”
- In that sense, “[...] utterances, which could potentially be evaluated as genuine impoliteness outside of the appropriate context, [but] are positively evaluated by in-group members who recognize the importance of ‘building a thick skin’ to face a hostile environment”

I know  
you  
cannot  
see it...

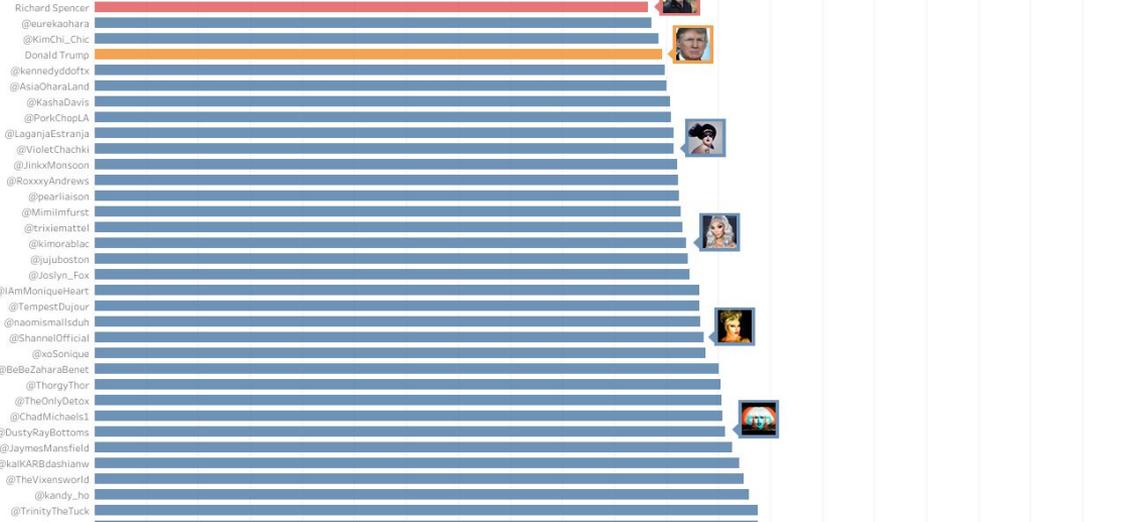
WAIT



# Michelle Obama



# Donald Trump



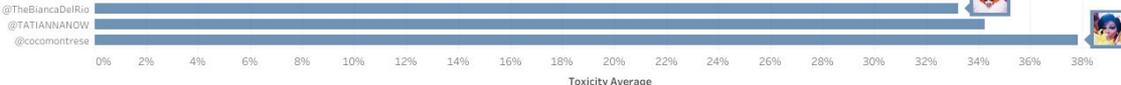
# Stefan Molyneux



# Bianca del Rio



# Coco Montrese





Tweets	Following	Followers	Likes
<b>3,886</b>	154	60.5K	2,275

**Yuhua Hamasaki**

@YuhuaHamasaki

Emmy Award Winning Season RuPaul's Drag Race S10  
yuhuahamasaki@gmail.com

[yuhuahamasaki.com](http://yuhuahamasaki.com)

Joined May 2009

[Tweet to Yuhua Hamasaki](#)

**Tweets**   **Tweets & replies**   **Media**

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July 23, 2018

# “You Don’t Want Second Best”

Anti-LGBT Discrimination in US Health Care

July 23, 2018 8:00AM EDT

Available In English 日本

# US: LGBT People Face Healthcare Barriers

## Trump Administration Set to Erode Existing Protections



### MORE READING



February 19, 2018 | New

**United States: Sta**

## Trump administration

- Wants to redefine sex as fixed and unalterable
- Remove sexual orientation and gender identity (SOGI) questions items from federal surveys

- The inability to access the medical data upon which a system was trained—for reasons of protecting patients' privacy or the data not being in the public domain—exacerbates this.
- An AI system could consolidate and deepen the already systemic inequalities in healthcare, all while making them harder to notice and challenge.
- Invariably, the result of this will be a system of medicine that is unfairly stacked against certain members of society

# Conclusions

An aging society, healthcare rising costs, and the promise of technology is pushing the adoption of robots and AI technologies in healthcare.

Many applications may help older adults, persons with disabilities, and children to participate in the society in a better way.

However, the application of the current regulatory framework is uncertain, and it is not very clear what are the minimum safeguards required to ensure a human-robot safe interaction

# Conclusions

Moreover, new applications challenge the understanding of what are the associated impacts, which may be positive (sex care robots for realizing disabled sexual rights) or negative (discrimination for the LGBT community).

Conducting Robot Impact Assessments could help match contexts, robot types, impacts, and existing legislation

# Thanks!

## ANY QUESTIONS?

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