

# A.I and Social robots

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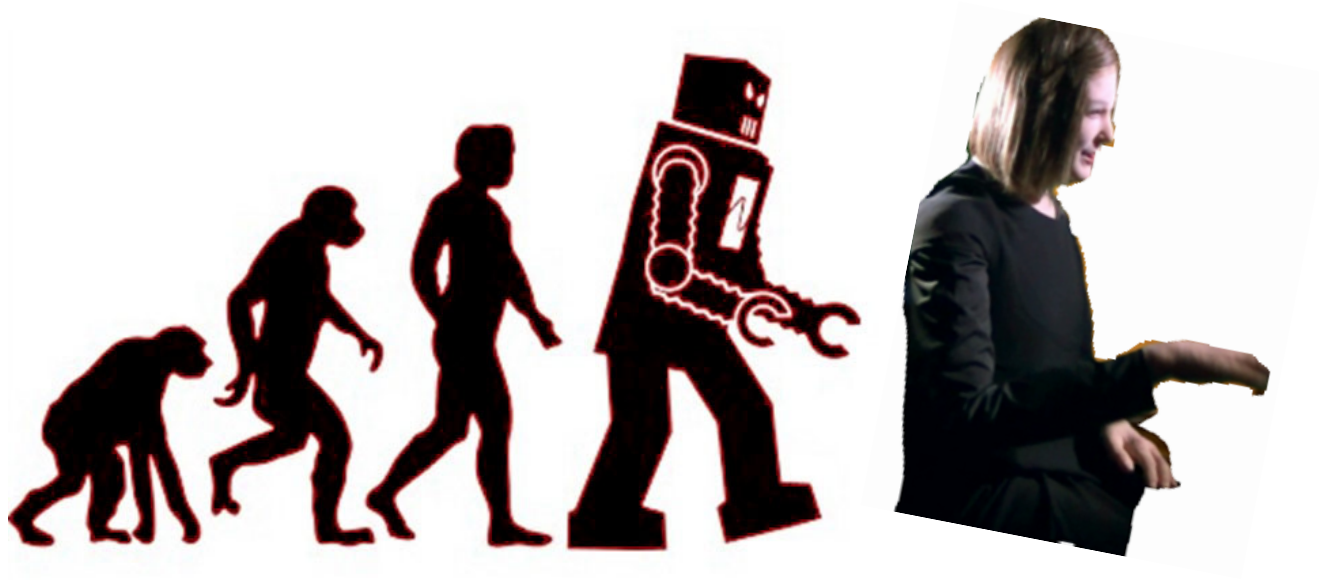
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# Empowering Human Capacity

- We have evolved and progressed.
- We have invented and discovered.
- **We are empowered...and soon overwhelmed...**



# A.I and Social robots



# From Mathematics Towards Modelling Intelligence

## George Boole (1815-1864)

introduced his algebra laws for the binary numbers. **It will be the basis of electronics 100 hundred years later**

Boolean algebra

| AND                  |   |   |
|----------------------|---|---|
| $f = x \cdot y = xy$ |   |   |
| x                    | y | F |
| 0                    | 0 | 0 |
| 0                    | 1 | 0 |
| 1                    | 0 | 0 |
| 1                    | 1 | 1 |

| OR          |   |   |
|-------------|---|---|
| $f = x + y$ |   |   |
| x           | y | F |
| 0           | 0 | 0 |
| 0           | 1 | 1 |
| 1           | 0 | 1 |
| 1           | 1 | 1 |

"inclusive OR"

| NOT      |   |   |
|----------|---|---|
| $f = x'$ |   |   |
| x        | y | F |
| 0        | 0 | 1 |
| 0        | 1 | 1 |
| 1        | 0 | 0 |
| 1        | 1 | 0 |

↑  
y is irrelevant

**Around 1940**, research in Neurology discovered that the brain was **an electrical network of neurons that fired in all or nothing pulses or signals (0/1)**



# From Computers to A.I



## Can a machine think? Turing Test (1950)

Put a machine and a human in a room and send in written questions. If we cannot tell which answers are from the machine or the human, the machine is thinking...



# What is A.I today?

- **Imbedded in several technologies** as speech synthesis and recognition, machine learning, recognition of images, gestures and actions, simulations of behaviours, deep learnings, etc
- Some futurists think the **SINGULARITY** — the point at which artificial intelligence can match, and then overtake, human intelligence — might happen in just 16 years, while others say by 2100. Either way, it's NOT SO FAR...



# Robots can replace Slavery

## GLOBAL SLAVERY FACTS

Slavery generates **\$150 billion**  
for traffickers each year

There are  
**tens of millions**  
of people in slavery today.  
Researchers estimate **21 million**  
are enslaved worldwide.

**78%**

of slavery victims  
today are in labor  
slavery

**22%**

of slavery victims  
today are in sex  
slavery

**26%**

of slaves today  
are children  
under age 18





# Humans can be replaced in these painful tasks by Robots





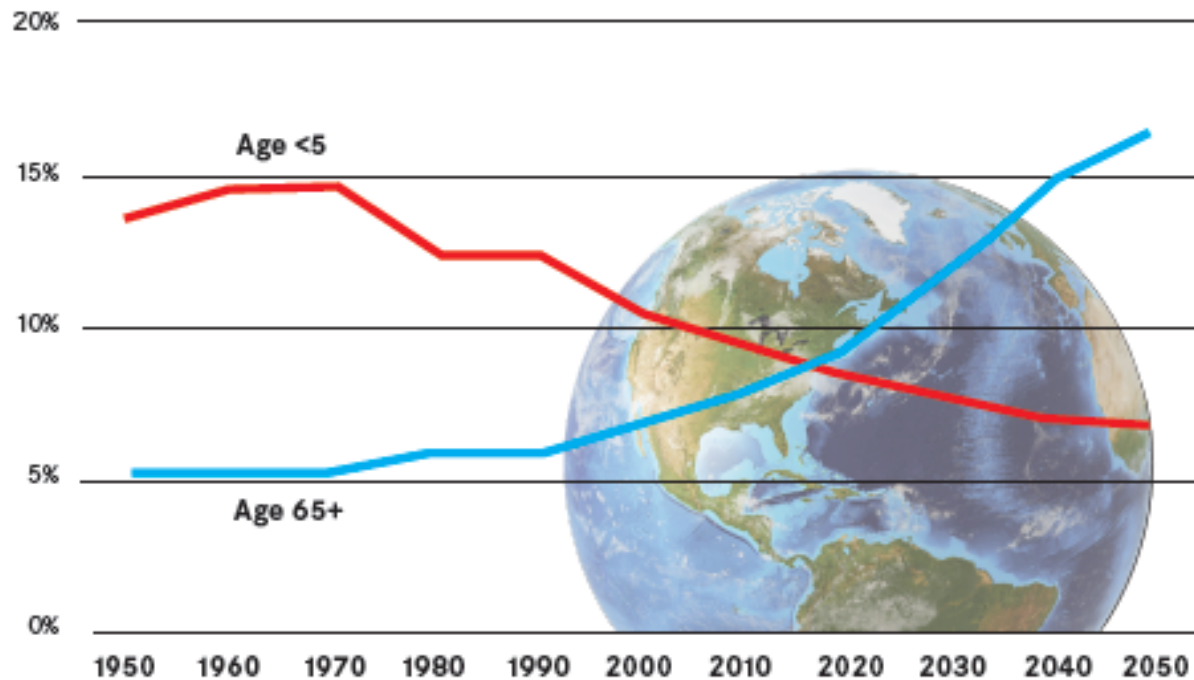
# What about Human loneliness...

- Elderly often feel lonely and are alone
- The situation is worsened over time...



# Societal Problems

FIGURE 1: YOUNG CHILDREN AND OLDER PEOPLE AS A PERCENTAGE OF THE GLOBAL POPULATION: 1950-2050<sup>1</sup>



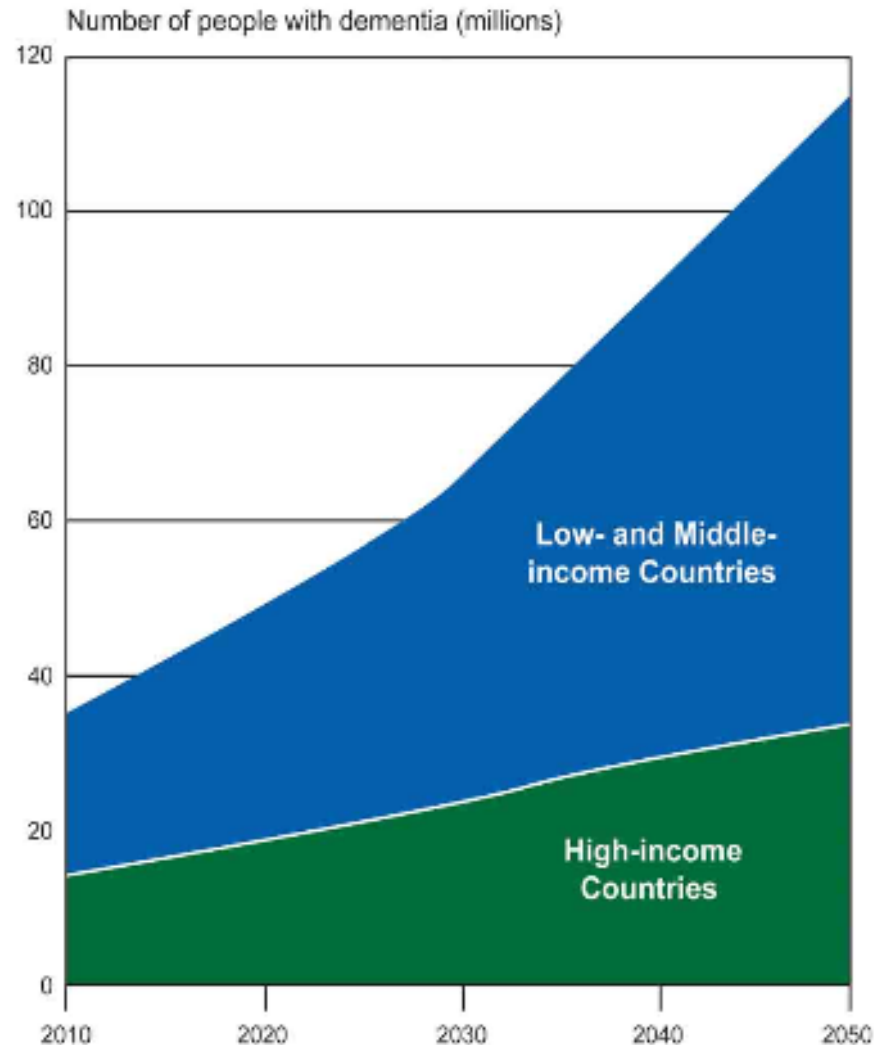
Source: *World Population Prospects: The 2010 Revision*, United Nations.

Adapted from *Global Health & Aging*, World Health Organization, 2011.

WHO: “The number of people aged 65 or older is projected to grow from an estimated 524 million in 2010 to nearly 1.5 billion in 2050, with **most of the increase in developing countries.**” In addition, by 2050, the number of people 65 years or older is expected to significantly outnumber children younger than 5 years of age

# Societal Problems

**The Growth of Numbers of People with Dementia in High- income Countries and Low- and Middle-income Countries: 2010-2050**



Source: Alzheimer's Disease International, *World Alzheimer Report, 2010*. Available at: <http://www.alz.co.uk/research/files/WorldAlzheimerReport2010.pdf>.

# Social robots can help when nobody is there...





# Nadine, our companion of the future?



