

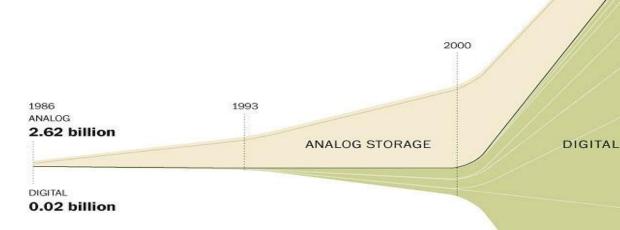


Foresight for Digital Development

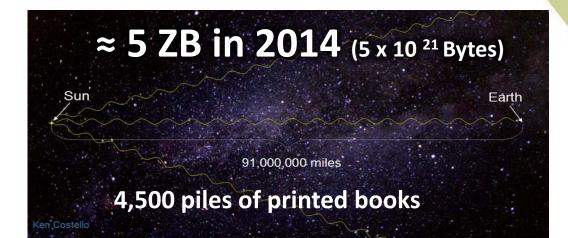


World's Info Storage Capacity

in optimally compressed MB



Stored digital information has doubled every 2.5 years



2007
ANALOG

18.86 billion gigabytes

Paper, film, audiotape and vinyl: 6.2%
Analog videotapes: 93.8%

Other digital media: 0.8%*

Portable media players, flash drives: 2%
Portable hard disks: 2.4%

CDs and minidisks: 6.8%

Computer servers and mainframe hard disks: 8.9%

Hilbert & López (2011).

The world's technological capacity to store, communicate and compute information.

Science, 332, 6025, 60-65

www.martinhilbert.net/WorldInfoCapacity.html

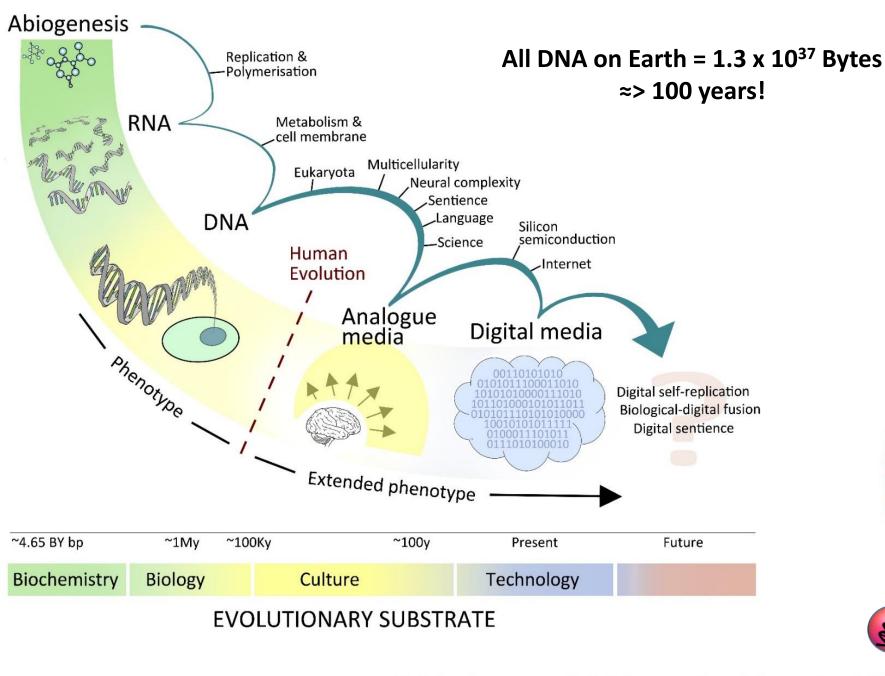
PC hard disks: 44.5%
123 billion gigabytes

DVD/Blu-ray: 22.8%

*Other includes chip cards, memory cards, floppy disks, mobile phones/PDAs, cameras/camcorders, video games

2007 DIGITAL

276.12 billion gigabytes



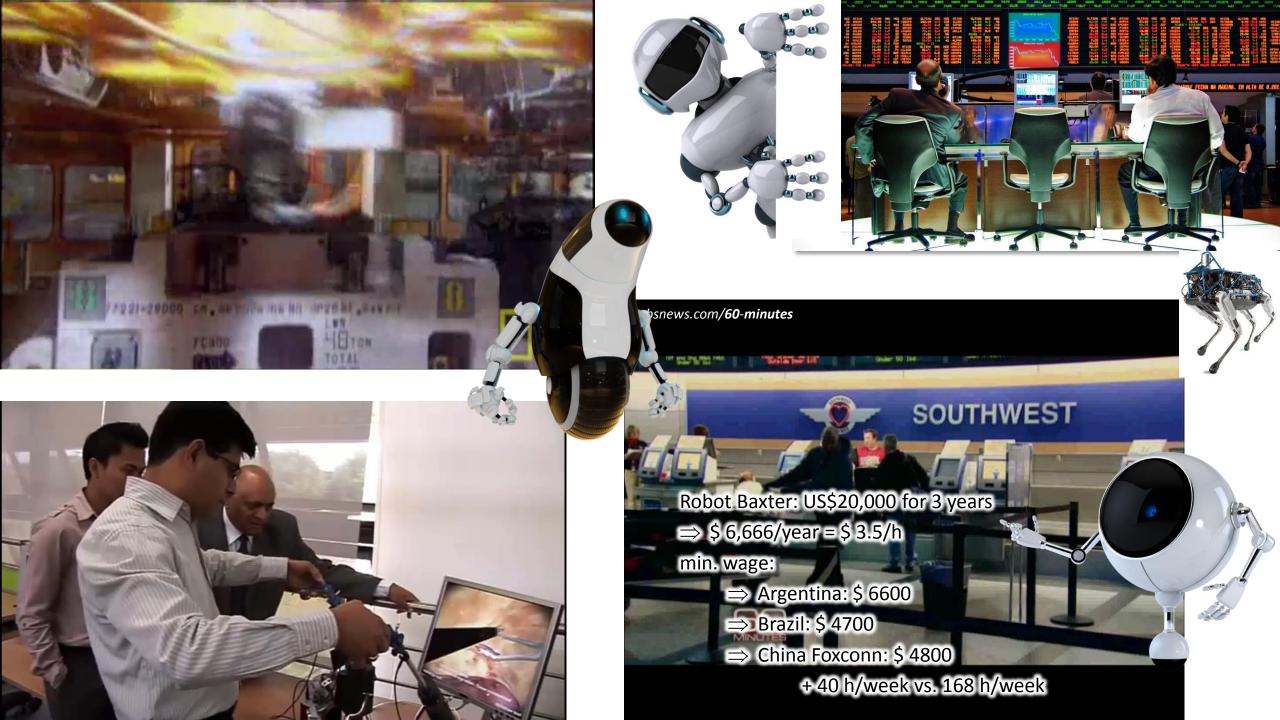
Gillings, Hilbert & Kemp (2016)
Information in the Biosphere:
Biological and Digital Worlds.

Trends in Ecology & Evolution,
31(3), 180–189

www.martinhilbert.net/information-in-the-biosphere/



7.2 bn humans * 6.2 bn nucleotides = 1×10^{19} Bytes vs. 5×10^{21} Bytes



Google DeepMind's Deep Q-learning

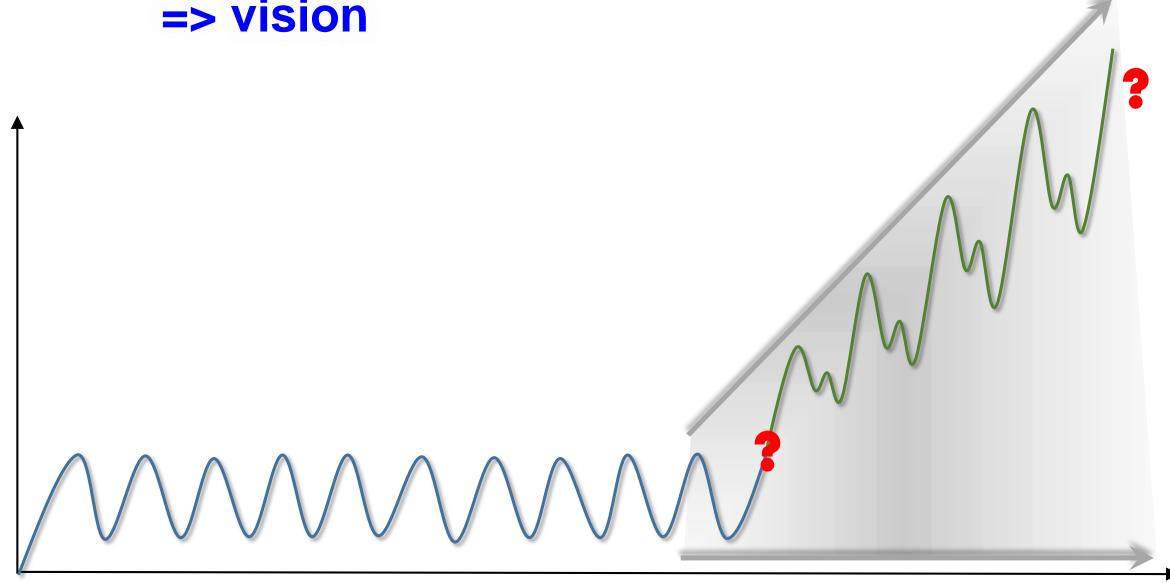
The algorithm will play Atari breakout.

The most important thing to know is that all the agent is given is sensory input (what you see on the screen) and it was ordered to maximize the score on the screen.

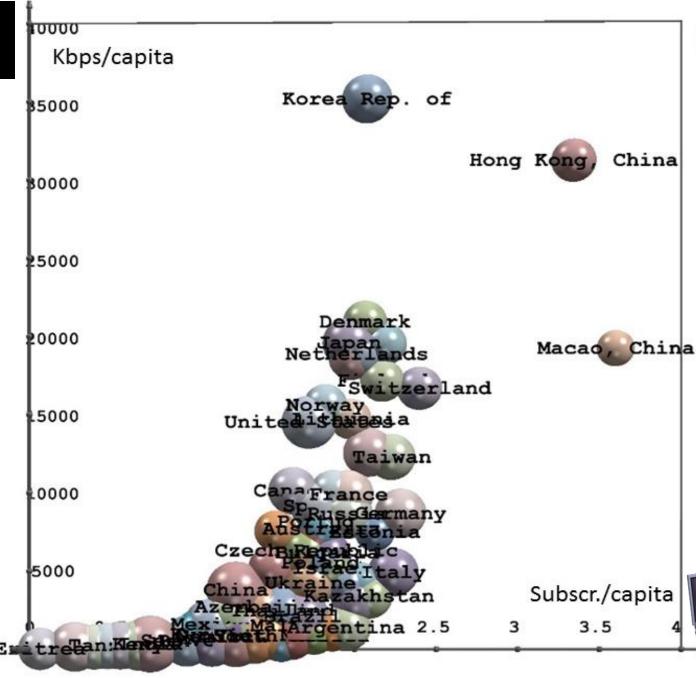
No domain knowledge is involved! This means that the algorithm doesn't know the concept of a ball or what the controls exactly do.

Challenge 1

=> vision



100101 000101 100001

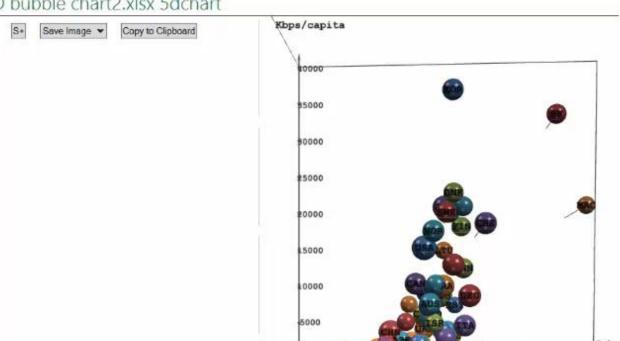


Challenge 2 => inequality

Hilbert (2016). The bad news is that the digital access divide is here to stay: Domestically installed bandwidths among 172 countries for 1986–2014. *Telecommunications Policy*.

www.martinhilbert.net/the-bad-news-is-that-the-digital-access-divide-is-here-to-stay

3D bubble chart2.xlsx 5dchart



Challenge 2 => inequality

Hilbert (2016). The bad news is that the digital access divide is here to stay: Domestically installed bandwidths among 172 countries for 1986-2014. Telecommunications Policy.

www.martinhilbert.net/the-bad-news-is-that-thedigital-access-divide-is-here-to-stay





So what?

Foresight for digital development

- ➤ Uncertainty of trajectory short-term flexibility
- > All-pervasiveness decentralized agenda
- ➤ Unpredictability of side-effects private-public alliance
- > Internationality of digital networks

 international coordination

So what?

Foresight for digital development

- ➤ Uncertainty of trajectory short-term flexibility
- > All-pervasiveness decentralized agenda
- ➤ Unpredictability of side-effects private-public alliance
- > Internationality of digital networks

 international coordination



Long term vision & short term actions

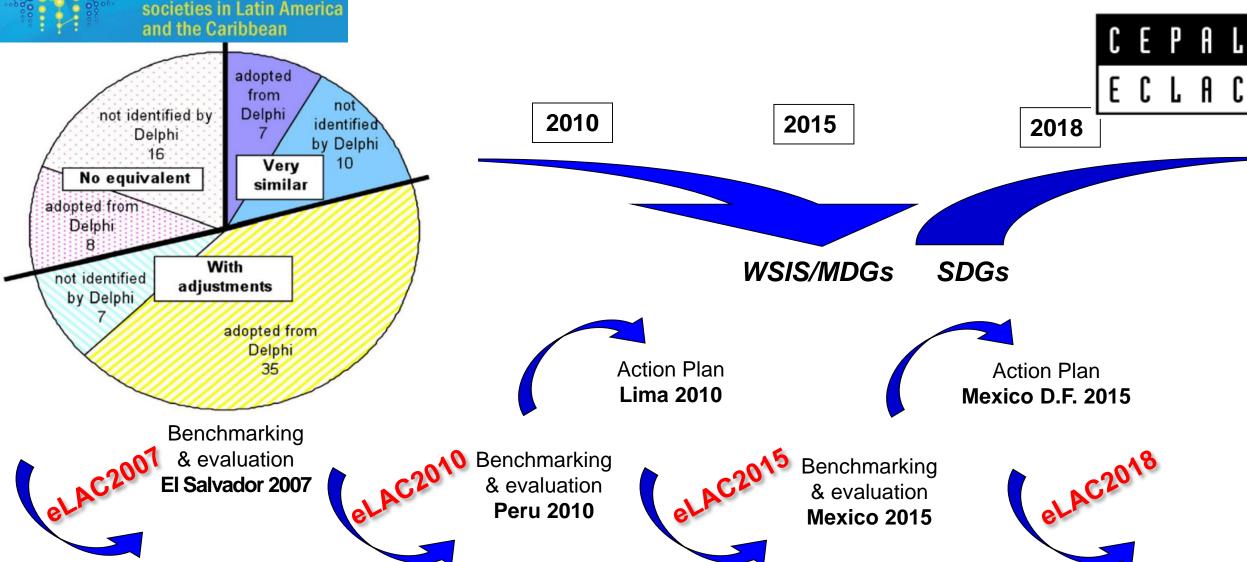






Long term vision & short term actions





So what?

Foresight for digital development

- > Uncertainty of trajectory short-term flexibility
- > All-pervasiveness decentralized agenda
- ➤ Unpredictability of side-effects private-public alliance
- > Internationality of digital networks

 international coordination

Consultation Meeting, Quito, May 2005

Regional Ministerial Conference on the Information Society, Rio de Janeiro, June 2005

eLAC2007 (Regional Action Plan 2005-2007)





decentralized agenda?

private-public alliance?

international coordination?

eLAC2007 (Regional Action Plan 2005-2007)

Areas of interest

Broadening the scope of thematic areas

Review priorities of eLAC2007 and gather new topics

Consolidating priority thematic areas

Prioritize areas of interest

Elaboration of policy options

Identify concrete goals and formulate policy actions

Consolidating policy options

Improve and prioritize

Fine-tune policy options

Fine-tune through face-to-face consultation

1: Virtual Voting

155 contributions

2: Virtual Voting

501 contributions

3: Personal Interviews

116 contributions

4: Virtual **Voting**

618 contributions

5: Personal Workshop

64 contributions

Regional Consultation Meeting, Buenos Aires, Oct.2007

71 participants, from 18 countries and 20 regional agencies

Written online comments on draft version

14 country contributions and 11 contributions from agencies

Regional Ministerial Conference, San Salvador, Feb.2008 210 participants, from 29 countries and 56 regional agencies 16 international

eLAC **Building inclusive** and innovative digital societies in Latin America and the Caribbean

institutions + 1,500 contributions

> "...the most extensive online participatory policy-making foresight exercise in the history of intergovernmental processes in the developing world..."

Hilbert, Miles, & Othmer, (2009). Foresight tools for participative policy-making in inter-governmental processes in developing countries: Lessons learned from the eLAC Policy Priorities Delphi. Technological Forecasting and Social Change, 76(7), 880-896.

www.martinhilbert.net/foresight-tools-for-participative-policy-making-in-inter-governmentalprocesses-in-developing-countries/

Policy

options

Intergovernmental negotiation

Main References:

- > Gillings, Hilbert & Kemp (2016). Information in the Biosphere: Biological and Digital Worlds. *Trends in Ecology & Evolution*, 31(3), 180–189 www.martinhilbert.net/information-in-the-biosphere/
- > Hilbert & López (2011). The world's technological capacity to store, communicate and compute information. *Science*, 332, 6025, 60-65 www.martinhilbert.net/WorldInfoCapacity.html
- > Hilbert (2016). The bad news is that the digital access divide is here to stay: Domestically installed bandwidths among 172 countries for 1986–2014.

 **Telecommunications Policy*. www.martinhilbert.net/the-bad-news-is-that-the-digital-access-divide-is-here-to-stay*
- > Hilbert, Miles, & Othmer, (2009). Foresight tools for participative policy-making in inter-governmental processes in developing countries: Lessons learned from the eLAC Policy Priorities Delphi. *Technological Forecasting and Social Change*, 76(7), 880–896. www.martinhilbert.net/foresight-tools-for-participative-policy-making-in-inter-governmental-processes-in-developing-countries/