tl;dr

root@planetEarth has been p0wned by our evil-twin
Late_stage_capitali$m.

#full environmental core dumped
filesize >9000 GigaKittens
#df /home/earth : 100% full
#systemctl status critical_life_support:
Active: failing

Attempting to ssh root@planetEarth...access denied

We must develop a 0-day to regain access, good luck and
GAIA save us all...
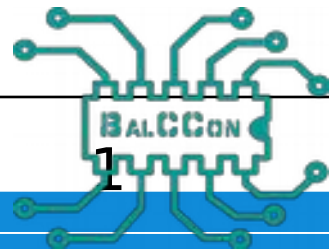
Into a climate changed world: Uncharted Waters

Dr. ir. Igor Nikolic

Associate professor
Systems Engineering group, Department of Multi-Actor systems
Faculty of Technology, Policy and Management
TU Delft

Bit of context

- engineer trying to use science to unfu*k the world

- hacker@revspace.nl playing with fire and steel, electrons and bytes, microbes and light

- Proud member of oBalccon LOC

- teacher, student, storyteller and organizer

- wannabe artist

- dad

root@planetEarth:~$man talk

- I don't really know what I am talking about
  - Trying to find ways to have a meaningful conversation

- Feel free to ask questions
  - clarification I will address straight away,
  - discussion please later

- I might get carried away and
  - talk too fast
  - throw academic jargon around

- This will be by far the most depressing talk of the event, its OK to leave…

What are we going to do today?

<science>
- A short context and (bit of) theory
- Expected state of the world
- Changes and impact
</science>

<design>
- Robust strategies?
</design>

<hope>
- Now what?

TUDelft

# I: Context and (a bit of theory)

<science>

TUDelft

Wicked problems

- no definitive problem formulation
- impossible to measure or claim success
- Solutions can only good or bad, not true or false. No idealized end state / solution.
- no template for solutions. literally make things up as as you go along.
- always more than one explanation for a wicked problem, depending greatly on the individual perspective
- symptom of another problem, completely interconnected systems
- Objective, scientific solutions impossible, value and norm
- Solutions are on-shot, as they irreversibly alter the problem
- You can not afford to be wrong

Rittel, Horst. "Dilemmas in a General Theory of Planning." Policy Sciences, 1973: 155-169.
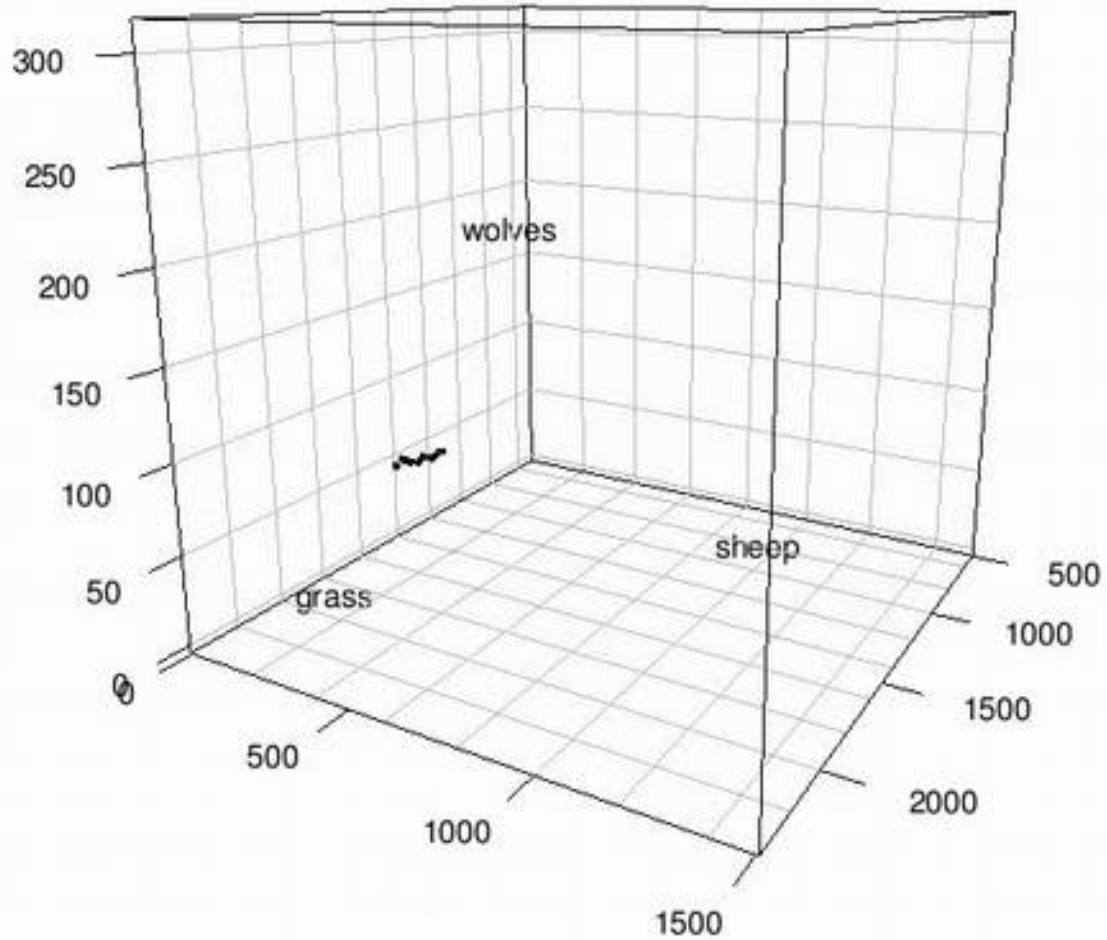
Chaos and energy input

- Chaos : iterative, path dependent systems, with extreme sensitivity to initial conditions and characteristic structure
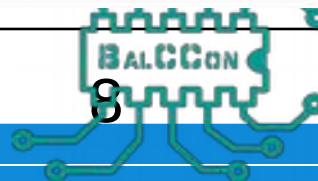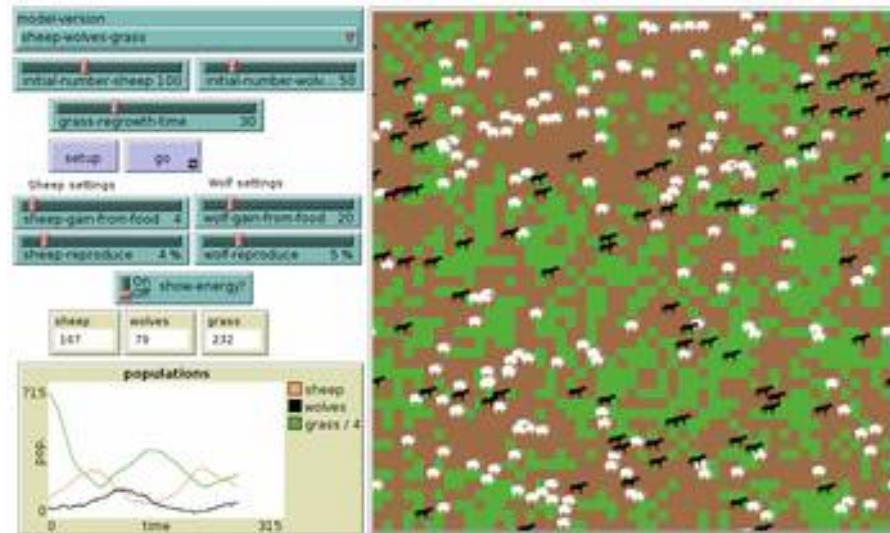
grass regrowth time = 21.48

Robust vs Resilient vs Adaptive

- Of what, to what, at which time scale?

- Robust : Withstand it

- Resilient : Recover from it

- Adaptive : Learn how to have fun with it

II: State of the world : We are f*cked

Pinned Tweet

Ben See
@ClimateBen

Remember:

1. The oceans are being killed.
2. Forests will soon be gone.
3. Fertile soil is disappearing.
4. Megafauna risk extermination.
5. Insects are vanishing.
6. Climate chaos is inevitable.
7. Extinction is now.
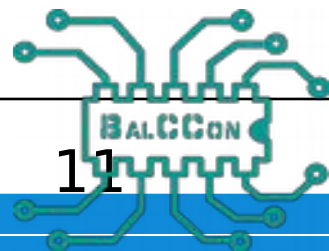8. Plastic is in our blood.

None of this is front page news.

12:15 AM · Mar 10, 2019 · Twitter Web App

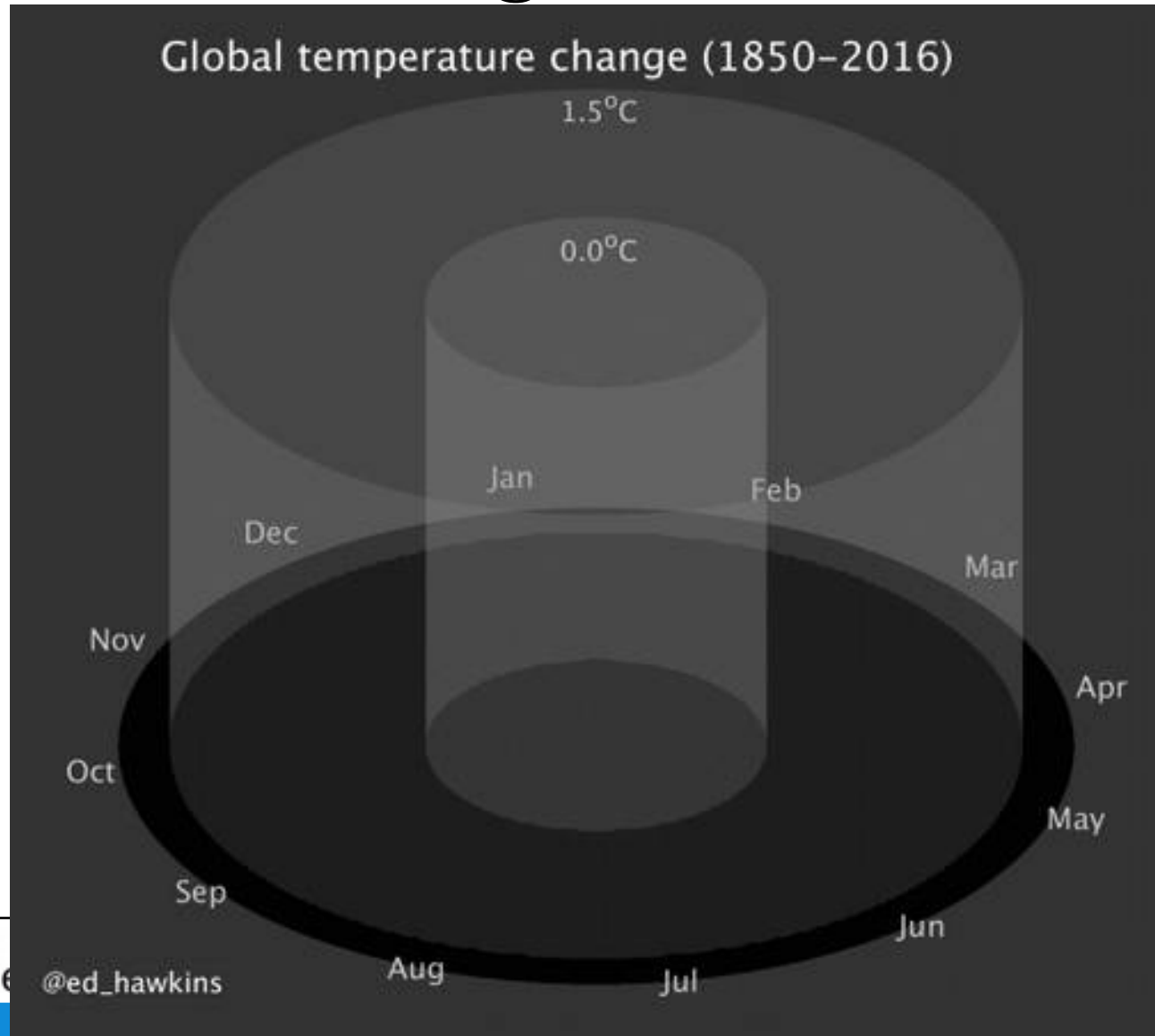144.7K Retweets   260K Likes

Exactly
- how
- when
- where
- how bad
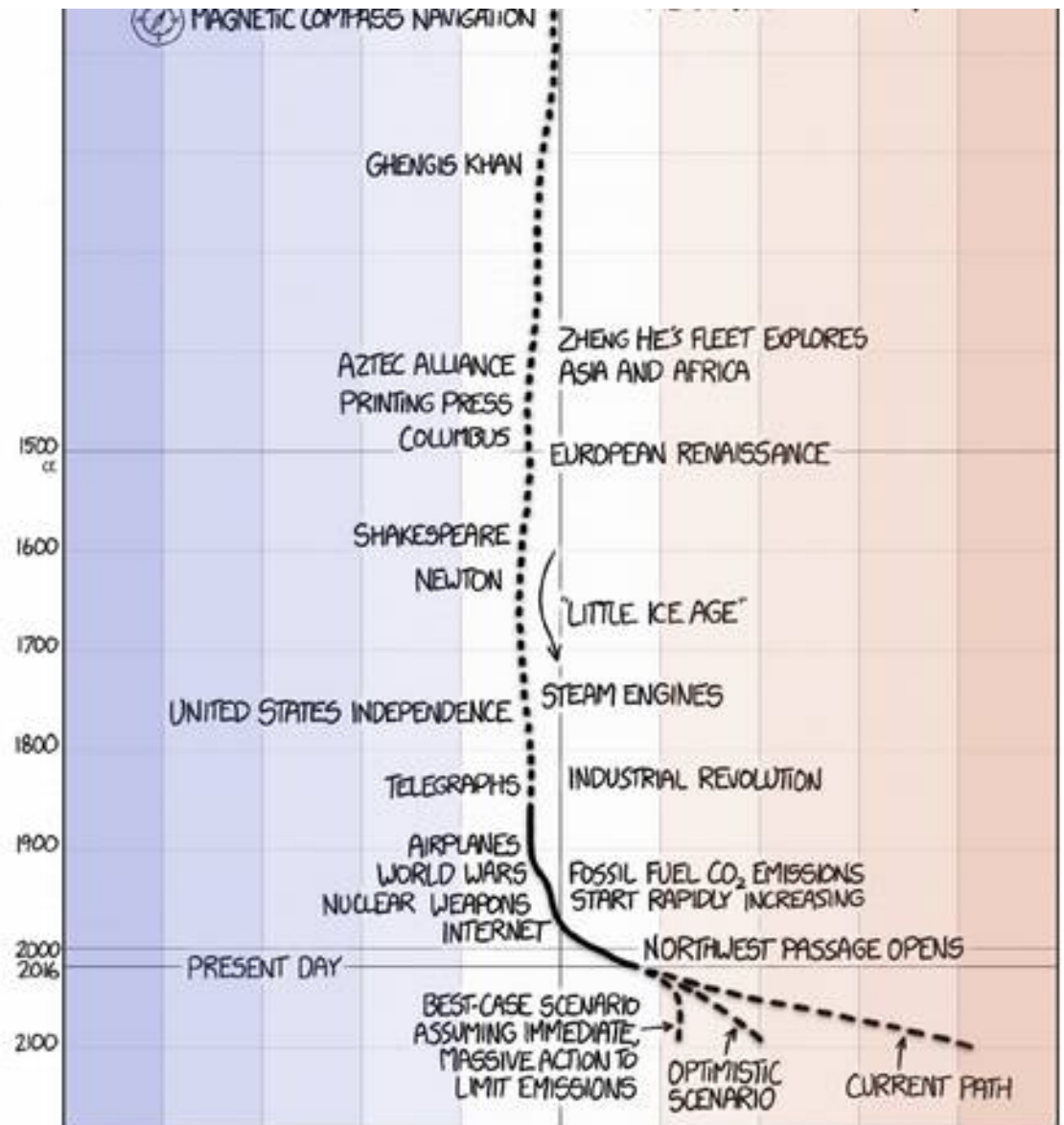 is uncertain

We can't fix it

- Very hard to notice / feel the problems

- We cant get it organized
  - power maintains status quo
  - conflicting interests
  - inertia and path dependency

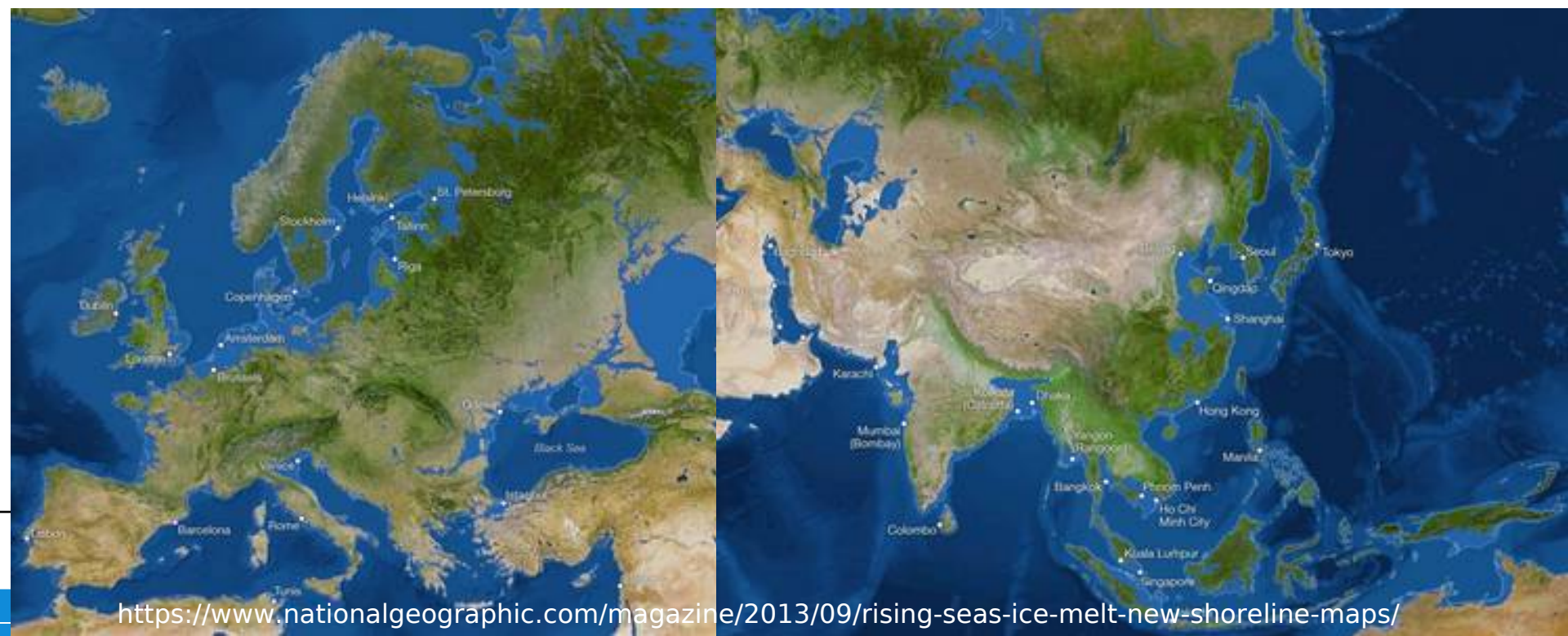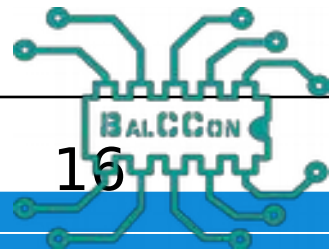- Technology is here, not the problem

Climate change

Global temperature change (1850–2016)

@ed_hawkins

13

Historical context

Delft

World past 2050?

- Similar to Eocene (56 to 34 Myears ago)
  - 700-900 PPM CO_2
  - Warm, moist, poles covered in forest

https://www.nationalgeographic.com/magazine/2013/09/rising-seas-ice-melt-new-shoreline-maps/

III: Changes and impacts

- Known
- Known unknowns
- Unknown unknowns

- Short term / Sudden
- Systemic

Ecological

- (much) more frequent (much) more extreme weather
  - Snow
  - Drought
  - Storms
  - Rainfall / flooding

- Ecosystem services decline
  - Pollination & insect die-off
  - Arable land loss
  - Carbon capture ↘
  - Methane production ↗

Economic

- Increase in
    - inequality
    - instability
    - food prices
    - energy prices

- Decrease in earning potential
    - Europe is heavy service oriented, limited primary production
    - Disruptions of logistic chains
   - Unavailability of products / raw materials
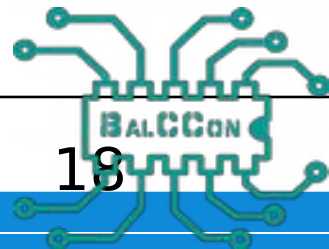
Financial

- Instability of financial markets

- Seeking stability
  - Property boom-bust cycles
  - Precious metals hoarding
  - Derivative for speculation
  - Further extraction of liquidity from markets

- Oh Noes!!1 There is no money for the energy transition

Social

- Very strong increase in immigration
  - 100s of M people on the move
- Strongly aging population in Europe
  - Fear, uncertainty and Alzheimer = ultra-conservative
- Extremism
  - Religious
  - Ethnic / nationalist
  - Racism
  - Strong man fetish / Fascism

- Neoliberal bullshit
  - Reduction in social safety nets
  - no state spending...
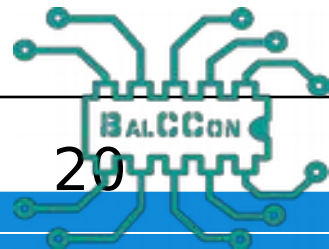
Technological

- Pervasive, fully automated surveillance compulsory

- Reduced access to / limitations on / criminalisation of
  - information
  - technology

- In pockets, further acceleration of high tech

Energy

- Increase of prices of
  - energy
  - storage capacity
  - fuels

- Stability of supply
  - Renewables variability / resource availability for tech

- Stability of distribution
  - infra under strain
  - decentralization requires immense investment

Transport

- Reduced ability to travel
  - internationally
  - regionally?

- Degradation of local infra
  - road/train

- Weather disruptions to air

Medicine

- Accelerating improvements, lifespan prolongation, genetics / editing
  - But only for the 0.01%

- Loss of biodiversity -> less new drugs

- General unavailability of drugs
  - supply chains, raw materials, etc

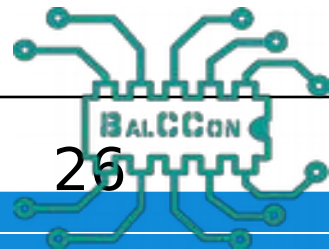- Antibiotic resistance rising fast
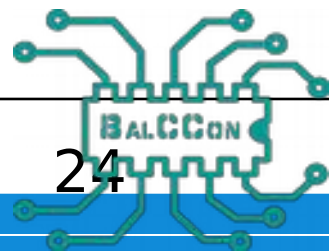
IV : Robust & adaptive strategies

</science>

<design>

"useless" strategies

- Extreme prepping
  - Hoarding / "innawoods" / paranoia / panic not sustainable or useful
  - **but:** disaster preparedness essential (storm/flood/etc)

- I will just leave...
  - No, you wont
  - Where to?
  - They wont have you!
 - **but:** you might have to...

TUDelft

Hacker attitude

- Curious
  - Dare open things up
  - Learn new things

- Critical
  - Not taking things at face value
  - Follow the money, power, passion

- Creative
  - Improvisation
  - Repair
  - Making do
  - Making new
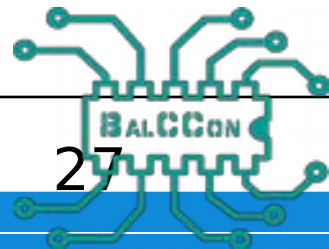
Value creation

- Using, making, improving open source
  - software
  - hardware
  - lowtech

- Communicate / Educate
  - name things
  - observe / point out
  - teach and train

- Organise
  - events
  - sessions
  - workshops
  - cooperatives
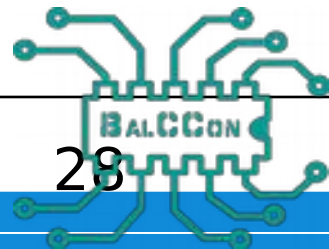
Emergency response skills

- Awareness
- First aid
- Context dependent disaster preparedness
- Ad-hock organisational skills

Extremely context dependent!
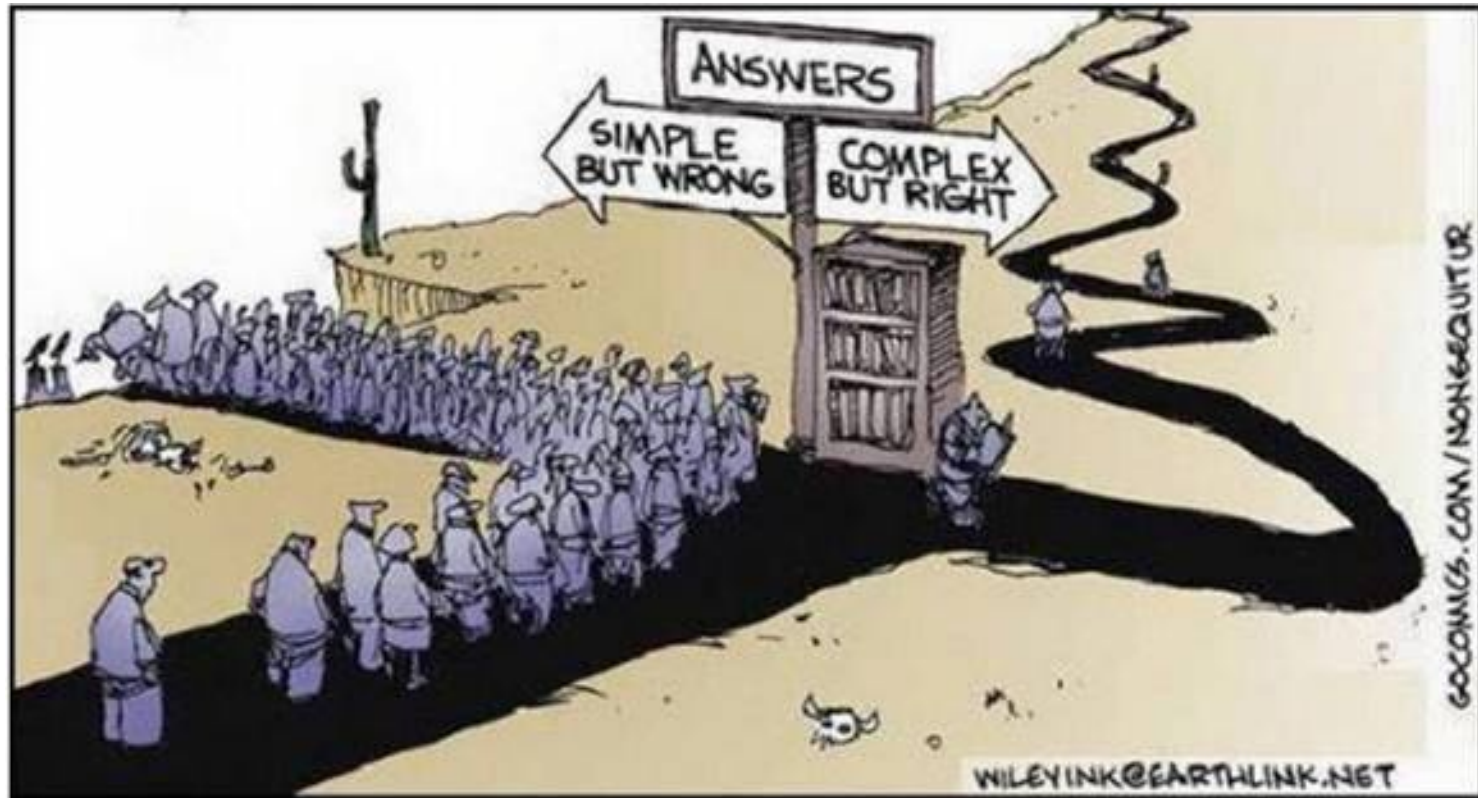
So now what?

Too late to be pessimistic...

- Go out and have fun
  - observing and planning
  - teaching and learning
  - getting organized

- Innovate and create, but keep in mind
  - How does it fit the big picture?

- Go out and vote for change!

be this guy…

Thank you!

Dr. ir. Igor Nikolic - I.nikolic@tudelft.nl - @ComplexEvo