CURRENT NATIONAL INNOVATION METHODS: APPROPRIATE FOR AI?

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JFIT Conference
April 2018
AGREED (IMPORTANT)
CONSEQUENCES OF AI

• Reduced demand for existing skills/jobs
• Development bottlenecks: Shortage of people who can do AI development. (This won’t be permanent)
• Result: increasing wage inequality
• The most important application of AI to work is Intelligent Assistance (IA)
  Helping skilled people work better. 737 Next Generation; robot surgery
• AI systems = probable effects on income and political power distributions:
  - Between technology owners and different kinds of workers.
  - Between consumers and Facebook
NATIONAL RESEARCH & INNOVATION SYSTEM: WHAT IS THE SYSTEM?

I. Startups for new ideas. VC model = lots of trials

II. US Government R&D

III. Big companies’ R&D
1. Amazon
2. Alphabet
3. Samsung
4. Intel
5. VW
6. Microsoft
7. Roche
GOVERNMENT BASIC RESEARCH?

USG research = mostly medicine
Basic research = tiny
AI => MAJOR CHANGES OF 3 TYPES

- **I. Free-standing AI applications:**
  - Autonomous vehicles, Smart aircraft
  - Engineering & business tools e.g. design
  - Smart appliances?? Tend to evolve to group II.

- **II. Networked applications of AI**
  - Running physical world: Internet of Things, smart home
  - Personal assistants (Alexa)
  - Business decisions - eg supply chains
  - These have Externalities everywhere: cyber crime, privacy, personal control, consumer manipulation.
    - *Cars which shut off if late on your car loan, or get an arrest warrant, or miss alimony payment or…*

- **III. Side effects = Employment, economic & political power,**
  Direct effects: ads, political campaigns, social network manipulation
  - We have few successful R&D models for Group II + III
EXISTING R&D SYSTEM

- **Independent products**: e.g. Autos, Consumer electronics, New materials
  - *Free-standing AI applications will fit here. Autonomous cars.*
- **Standards-based** networked products:
  - Cellular networks, Computers, Cloud
- **Social networks** = oligopolies
  - FAGA (Facebook, Amazon, Google, Apple) (no longer?) Cable networks
  - Work well for a few winning companies.
  - Why: Network externalities
  - Very bad with social and personal externalities.
  - *Network AI systems here: Personal assistance, social interaction, collaborative systems (decentralized work)*
- **Govt. subsidized research priorities**: Pharma (but not health care)
  - *Might AI problems get government research subsidies? Not successfully*
WHERE NATIONAL INNOVATION SYSTEM HAS DONE BADLY

- Cyber-security.
  - No financial incentives
  - No regulatory pressure (unlike aviation)
  - Decentralized products
  - The 1970s IBM, 1990 Microsoft might have done better

- Health care:
  - Life expectancies stagnant
  - Birth weight, maternal mortality,
  - Threat of drug resistance

- Carbon emissions
Setting the Body’s ‘Serial Killers’ Loose on Cancer

After a long, intense pursuit, researchers are close to bringing to market a daring new treatment: cell therapy that turbocharges the immune system to fight cancer.

By ANDREW POLLACK AUG. 1, 2016

Odds of survival can greatly improve for people with the most common type of lung cancer if they are given a new drug that activates the immune system along with chemotherapy, a major new study has shown.

The findings, medical experts say, should change the way doctors treat lung cancer: Patients with this form of the disease should receive immunotherapy as early as possible.
4.9% in 2017 (est.)
CAN SOCIAL SCIENCE DEVISE A SOLUTION?

1. In principle
2. Biggest problems require major shifts
   Who controls research, new standards from FAGA companies
3. AI likely to reinforce rather than weaken wealth and power distribution
4. Externalities will continue to worsen: privacy, security, income distribution, happiness