

Artificial Intelligence in the World

Prof. Levy

Fromm Institute

Spring Session, 2017

Lecture 3 agenda

- **Conversation with Kevin Kelly**, author of *The Inevitable*
- **Who is doing AI?**
- Key people in AI – **Fei-Fei Li**
- **Neural nets & supervised learning** – Andrew Ng

Who is doing AI? (1)

- ***Chinese companies***
 - **Baidu** (lab in Silicon Valley) [Andrew Ng]
 - **(Alibaba)**
 - **Tencent** (Hong Kong Univ.)
 - **Didi Chuxing** [like Uber]
- ***Chinese Universities***
 - **Tsinghua**
 - **Peking**

Who is doing AI? (2)

- **British companies & universities**

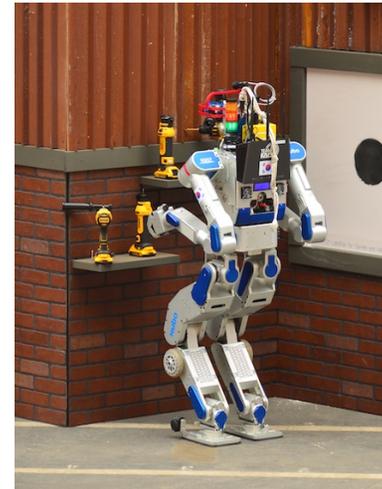
- ***Microsoft/Cambridge University***

- The Leverhulme Centre for the Future of Intelligence (CFI) [Stephen Hawking]
 - "In short, success in creating AI could be the biggest event in the history of our civilisation," Hawking said.
 - The centre is a collaboration between the universities of **Oxford, Cambridge, Imperial College London, and Berkeley, California.**

- ***DeepMind (now part of Google) – Go-playing AI***

Who is doing AI? (3)

- **Korean**
 - ***Samsung***
 - Samsung to Acquire **Viv**, the Next Generation Artificial Intelligence Platform [in San Jose, CA]
 - <http://viv.ai/>
 - **KAIST**
 - South Korea's DRC-HUBO Robot
 - Won the **DARPA Robotics Challenge**
 - (2015)



Who is doing AI? (4)

- **Norwegian**

- ***University of Agder*** Centre for Artificial Intelligence Research
- “...there has been a revolution ...**artificial intelligence has become an important factor in social development and in trade and industry,**” says Professor Ole-Christoffer Granmo at the University of Agder (UiA).
- There are also **two philosophers** associated with the centre who are there for the purpose of problematising **ethical** concerns – for example how self-driving cars should behave in accident situations.

Who is doing AI? (5)

- **Japan**

- Japan is strongest in **robotics**. **Softbank's Pepper**—described as the world's **first personal robot**
- Mitsuru Ishizuka ...at Waseda University and ... University of Tokyo...working in AI at the latter institution since 1980 ... admits that Japan is considerably behind the United States in “deep learning,” a central technology in AI, although the country is working hard to catch up. For instance, the government has established a **new AI research center**, and is planning another one to promote AI in the country.

Who is doing AI? (6)

- **American companies (part a)**
 - **IBM** (*Deep Blue* – chess champion in 1997)
 - **Amazon**
 - Amazon reportedly employs 1,000 people in artificial intelligence.
 - **Apple** (UW / Seattle)
 - Apple CEO says iPhone's future is in AI
 - Apple will open a research and development base in Yokohama, near Tokyo, later this year (2016).
 - Earlier this month (August, 2016), the company reportedly bought Turi, a Seattle-based startup company and the latest purchase in a string of acquisitions aimed at bolstering its machine learning and AI capabilities.
 - **Google** (*DeepMind*)
 - Google X Lab [Fei-Fei Li]
 - **Facebook**
 - “We have incredible people in FAIR who are making significant progress in AI, but to really move the bar it’s equally as important to be outward focused. To push the envelope, push the science and technology forward, we must be actively engaged with the research community. We publish a lot of things we do, distribute a lot of code on open-source, and engage deeply with academia to drive the progress.” — Yann LeCun, Director of AI Research

Who is doing AI? (7)

- **American companies (part b)**
 - **Salesforce**
 - Salesforce Unveils Artificial Intelligence 'Einstein' Service
 - "There is an absolute revolution occurring in artificial intelligence," ... the team has more than 175 data scientists.
 - "Predictive Lead Scoring" to rank which sales leads are most likely to turn into a closed deal.
 - **Microsoft**
 - "We are infusing AI technology into all Microsoft products," AI chief Harry Shum says, and he has plans for **Cortana**, too.
 - **Intel**
 - Intel actively works with the open source community and also offers a variety of libraries and APIs to accelerate AI progress and broaden access to powerful tools.

Who is doing AI? (8)

- **American universities** (too many to show or count)
 - **UC Berkeley** launches Center for Human-Compatible Artificial Intelligence
- ***automobile companies***
 - **Ford** (Argo AI)(Palo Alto research center)
 - **GM** (invested in Lyft, Cruise Automation), Silicon Valley tech center
 - **Chrysler**
 - **Tesla**
 - (Uber)
 - (Google)
 - (Apple?)

Who is doing AI? (9)

- ***U.S. government (Federal agencies)***
 - DHS (Homeland Security)
 - DOE (Energy)
 - NASA (Space)
- ***Other organizations -- “Partnership on AI”***
 - Amazon
 - Google / DeepMind
 - Facebook
 - IBM
 - Microsoft
- ***See HBR “The State of Machine Intelligence” chart***
 - (page 4 of the Lecture 4 handouts)



People of AI – Fei-Fei Li

Fei-Fei Li, who publishes under the name Li Fei-Fei (Chinese: 李飛飛/李飞飞), is an Associate Professor of Computer Science at Stanford University. She is the **director of the Stanford Artificial Intelligence Lab** and the **Stanford Vision Lab**. She works in the areas of computer vision and cognitive neuroscience.

Associate Professor at *the Computer Science Department* at **Stanford University**
Ph.D. degree from **California Institute of Technology**
B.S. in Physics from **Princeton University**.

- **Fei-Fei Li (Stanford / Google) on vision systems in AI**
 - <https://www.youtube.com/watch?v=VBjqWogh6Gw>
 - 11:30 quest to build (visually) intelligent machines
 - 21:00 neuron-like units in networks / layered in hierarchies
 - 26:00 components of a model
 - 25:50 is AI a force for destruction or ...?
 - Under-representation of women & minorities

Neural networks & supervised learning

- **Andrew Ng – lecture on what AI can do / neural nets**
 - <https://www.youtube.com/watch?v=21EiKfQYZXc&feature=em-subsdigest-vrecs>
 - 7:30-10:30 Supervised Learning
 - 14:40 1 second of thought
 - 25:00 Neural Nets
 - 38:00 Hype / Anti-AI
 - 39:00 No clear path to sentience
 - machine learning course, lecture 1
 - <https://www.youtube.com/watch?v=UzxYlbK2c7E>
 - 8:30